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Soneplex® Broadband System Operation and Maintenance Manual (V5.3)

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REVISION HISTORY

ISSUE	DATE	REASON FOR CHANGE
1st Edition, Issue 1	10/1995	Original.
1st Edition, Issue 2	03/1996	Added Version 5.1 software update and corrected typographical errors.
1st Edition, Issue 3	01/1998	Corrected typographical and artwork errors, updated format (added TOC 3rd level, alphabetical task list, and expanded related manuals listing), changed part number due to technical changes.
Issue 4	06/2000	Technical changes.

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LIST OF CHANGES

The technical changes incorporated into this issue are listed below.

SECTION	IDENTIFIER	DESCRIPTION OF CHANGE
—	Cover/Title page	Removed list of contents.
FM	Related Publications	Added new publications.
FM	List of Acronyms and Abbreviations	Added new acronyms and abbreviations.
1	TAD-101	Turned specifications into a TAD. Combined Version D HLXC tables and Version E HLXC information into one table.
—	Various	Changed “smartjack” to “NID”.
Old Sections 1, 3, 4, and 5		Removed and transferred sections on system description and front panel interface to 61-472 (Soneplex Description, Design, and Application Manual).
—	Various	Added information on dual repeater functionality, Version E HLXC, Version E HLXR, HLXR 3192, and RLXIOR throughout manual.
—	—	Removed NTP-006 (empty page) and renumbered successive NTPs.
—	—	Changed DLP-524 (Access Identifier) to TAD-106, and renumbered successive DLPs.
—	—	Removed DLP-532 (empty page) and renumbered successive DLPs.
—	—	Added TAD-102 (Loopback Process Description)
—	—	Moved “TBOS Daisy-Chaining” from TBOS section; created DLP-574 from it.
—	—	Moved TBOS interface description information from TBOS section; created TAD-104 from it.
—	—	Moved TL1 interface description information from TL1 section; created TAD-105 from it.

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GENERAL INFORMATION

ABOUT THIS MANUAL

This manual describes how to operate and maintain the ADC Soneplex Broadband system (V5), which is a DS1-based multiplexer with an interface that is compatible with DS3 networks. It is specifically designed for use as a hub to distribute DS1 HiCap circuits for local access. For a complete description of the Soneplex Broadband system, refer to Soneplex Description, Design, and Application manual, listed under Related Publications in this section.

RELATED PUBLICATIONS

Listed below are related manuals and their publication numbers. Copies of these publications can be ordered by contacting the ADC Technical Assistance Center at 1-800-366-3891 (in U.S.A. or Canada) or 612-946-3000, extension 3223 (outside U.S.A. and Canada).

Title	ADCP Number
DS1 Fiber Loop Converter One Position Wall Mount Cabinet User Manual	61-122
DS3 Soneplex Remote Control System Description Manual (V5.1 or later)	61-490
DS3 Soneplex Remote Control System Installation Manual (V5.1 or later)	61-489
DS3 Soneplex Remote Control System Operation Manual (V5.1 or later)	61-488
Fiber Loop Converter (FLC) Installation, Operation and Maintenance Quick Reference Guide	61-124
Fiber Loop Converter Model 4 Position Universal Wall Mount Cabinet User Manual	61-120
Fiber Loop Converter Two Position Horizontal Mounting Shelf User Manual	61-125
Model FLC-A10MPU Fiber Loop Converter Micro Processor Unit	61-129
Quad DS1 Fiber Loop Converter (B2/B3/D3) User Manual	61-135
Quad Loop Extender (QLX) and Remote Terminal Description Manual	61-151
Quad Loop Extender (QLX) Operation and Maintenance Manual	61-152
Soneplex Broadband System Chassis Installation Manual	61-412
Soneplex Integrated Broadband Chassis Installation Manual	61-768
Soneplex Broadband System Description, Design and Application Manual (V5)	61-470
Soneplex Broadband System Reference Guide (V5)	61-473
Soneplex HLXR 3192 Remote System Operation and Maintenance Manual	61-732
Soneplex Main Processor Unit (MPU) Installation Instructions	61-495
Soneplex RTAU (Remote Test Access Unit) Installation Instructions	61-743
Soneplex Test Access Unit Installation Instructions	61-449
Soneplex System TL1 Interface Specification	61-419
Soneplex System X.25 Concentrator Installation and Operation Manual	61-708
Soneplex Version D or later HLXR Remote System Operation and Maintenance Manual	61-314

ADMONISHMENTS

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment. An admonishment identifies a possible hazard and then explains what may happen if the hazard is not avoided. The admonishments — in the form of Dangers, Warnings, and Cautions — must be followed at all times. These warnings are flagged by use of the triangular alert icon (seen below), and are listed in descending order of severity of injury or damage and likelihood of occurrence.

Danger: *Danger is used to indicate the presence of a hazard that* ***will*** *cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*

Warning: *Warning is used to indicate the presence of a hazard that* ***can*** *cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*

Caution: *Caution is used to indicate the presence of a hazard that* ***will*** *or* ***can*** *cause minor personal injury or property damage if the hazard is not avoided.*

GENERAL SAFETY PRECAUTIONS

Danger: *To avoid electric shock, be careful when working near HDSL loop connections or telecommunications circuits. An electrical potential of ±130 volts exists on HDSL loop connections and telecommunications circuits. Coming in contact with this high electrical potential will result in death or severe personal injury.*

Danger: *Do not look into the ends of any optical fiber, or look directly into the module fiber connectors. Exposure to invisible laser radiation may result, which can damage the retina of the eye. An optical power meter should be used to verify active fibers.*

Warning: *To prevent electrical shock, never install telephone equipment in a wet location or during a lightning storm. When installing or modifying telephone lines, disconnect lines on the network side before working with uninsulated lines or terminals.*

Caution: *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

FCC COMPLIANCE STATEMENT

Class A

The Soneplex Broadband system has been certified to comply with the requirements for class A computing devices per part 15 of the FCC regulations.

Warning: *This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with limits for a Class A digital device pursuant to Subpart B of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference to TV and radio reception in which case the user, at their own expense, will be required to take whatever measures may be required to correct the interference.*

This equipment does not exceed Class A limits for radio emission for digital apparatus, set out in the radio interference regulation of the authorization methods of Industry Canada. Operation in a residential area may cause unacceptable interference to TV and radio reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

This product conforms to all applicable standards of 21 CFR 1040.

CERTIFICATION

UL Listed

The Soneplex Broadband system is compliant with UL 1459, Second Edition.

STANDARDS

The following listing is a bibliography of applicable documents:

ANSI T1.231	Layer 1 In-Service Digital Performance Monitoring.
CB-149	Maintenance Standards for Digital Transmission Systems, Issue 4, November 1, 1989.
GR-63-CORE	Network Equipment-Building (NEBS) Generic Equipment Requirements, Physical Protection, Issue 1, October 1995.
GR-487-CORE	Generic Requirements for Electronic Equipment Cabinets, Issue 1, June 1996.
GR-499-CORE	Transport Systems Generic Requirements (TSGR): Common Requirements, Issue 1, December 1995.
GR-1089-CORE	Electromagnetic Compatibility and Electrical Safety Generic Criteria for Network Telecommunication Equipment, Issue 2, November 1997, Revision 1, February 1999.

TA-NWT-001210	Generic Requirements for High Bit Rate Digital Subscriber Lines (HDSL), Issue 1, October 1991.
TR-TSY-000827	OTGR: Generic Operations Interfaces: Non-OSI Communications Architecture, Sections 11.1 and 11.3 (Issue 1).

LIST OF ACRONYMS AND ABBREVIATIONS

The acronyms and abbreviations used in this manual are detailed in the following list:

ADM	Add/Drop Multiplexer
AIS	Alarm Indication Signal
ALM	Alarm
AMI	Alternate Mark Inversion
ANSI	American National Standards Institute
APS	Automatic Protection Switching
APU	Alarm Processor Unit
ATAG	Autonomously Generated Correlation Tag
AWG	American Wire Gauge
B3ZS	Bipolar Three-Zero Substitution
B8ZS	Bipolar Eight-Zero Substitution
BB	Broadband
BBC	Broadband Chassis
BER	Bit Error Rate
BIP	Bit Interleaved Parity
BPS	Bits Per Second
BPV	Bipolar Violation
CAM	Communications Access Module
CCAS	Communication Channel Access System
CEV	Controlled Environmental Vault
CGA	Carrier Group Alarm
CI	Customer Interface
CIF	Craft Interface
CKT	Circuit
CLEI	Common Language Equipment Identifier
CO	Central Office
CPE	Customer Premises Equipment
CPM	Craft Performance Monitor module (used in a Remote Terminal cabinet)
CR	Critical
CRC	Cyclic Redundancy Code
CRP	Repeater - Central Office (network) side (MPU version 5.2 and 5.3)
CSA	Carrier Serving Area
CSU	Channel Service Unit
CTAG	Correlation Tag
CV	Code Violation
DCE	Data Communication Equipment

DFMS	Digital Facility Maintenance System
DLP	Detailed Level Procedure (TOP term)
DLX	DS1 Loop Extender module (BB system only)
DS1	Digital Signal - Level 1
DS2	Digital Signal - Level 2
DS3	Digital Signal - Level 3
DS3 MUX	DS3 Multiplexer module
DSX	Digital Signal Cross-Connect
DTE	Data Terminal Equipment
ESD	Electrostatic Discharge
ESF	Extended Super Frame
EV	Event
EXT	External
EXZ	Excessive Zeros
FCC	Federal Communications Commission
FE	Far End
FEND	Far End
GND	Ground
HDSL	High-bit-rate Digital Subscriber Line
HEMI	High Power HDSL Module
HiCap	High Capacity
HLXC	HDSL Loop Extender - Central Office module
HLXR	HDSL Loop Extender - Remote module
HRX	HDSL Repeater
HS	High Speed
HSP	High Speed Protect slot for EC1M module (in SONET system only)
HSW	High Speed Working slot for EC1M module (in SONET system only)
IS	In Service
IXL	Task Index List (TOP term)
KBPS	Kilobits Per Second
KFT	Kilo Feet
LAPB	Link Access Procedure Balanced
LE	Loop Extender
LEC	Local Exchange Carrier
LEC	Loop Extender Chassis
LED	Light Emitting Diode
LIU	Line Interface Unit
LMPTST	Lamp Test
LOP	Loss of Pointer
LOS	Loss of Signal
LOSW	Loss of Synch Word
LS	Low Speed
MBPS	Megabits Per Second
MJ	Major
MN	Minor

MON	Monitor
MPU	Main Processor Unit
MUX	Multiplexer
MXP	DS3 MUX Protect slot
MXW	DS3 MUX Working slot
NE	Near End
NE	Network Element
NEND	Near End
NID	Network Interface Device
NMA	Bell Network Monitoring and Analysis System
NRZ	Non-Return-to-Zero
NTP	Non-Trouble Clearing Procedure (TOP term)
OAM&P	Operation, Administration, Maintenance & Provisioning
ODS2	Optical Digital Signal 2
OOF	Out Of Frame
OOS	Out Of Service
OR	a type of Boolean operator
OSS	Operations Support System
OTGR	Operations Technology Generic Requirements
PC	Personal Computer
PCB	Printed Circuit Board
PIC	Plastic Insulated Cable
PID	Personal Identification
PM	Performance Monitoring
PRM	Performance Report Message
PVC	Permanent Virtual Circuit
PWR	Power
QFLC	Quad Fiber Loop Converter module
QLX	Quad DS1 Loop Extender module
R	Ring
RAI	Remote Alarm Indication
RCV	Receive
RDI	Remote Defect Indication
REPC	Repeater - Central office (network) side (MPU version 5.1)
REPR	Repeater - Remote (customer) side (MPU version 5.1)
RFI	Remote Failure Indication
RLX	Repeater Loop Extender module
RLXIOR	Repeater Loop Extender Intelligent Office Repeater
RMT	Remote
RRP	Repeater - Remote (customer) side (MPU version 5.2 and 5.3)
RTAU	Remote Test Access Unit
RX	Receive
SEF	Severely Errored Framing
SF	Super Frame
SLM	Signal Label Mismatch

SNR	Signal-to-Noise Ratio
SONET	Synchronous Optical Network
SPX	Soneplex
St	Status
STAT	Status
STK	Streaker module
SVC	Switched Virtual Circuit
T	Tip
TAD	Trouble Analysis Data (TOP term)
TAP	Trouble Analysis Procedure (TOP term)
TASC	Telecommunications Alarm Surveillance and Control
TAU	Test Access Unit
TBOS	Telemetry Byte Oriented Serial
TID	Target Identifier
TL1	Transaction Language 1
TOP	Task Oriented Process
TSGR	Transport Systems Generic Requirements
TX	Transmit
VC	Virtual Circuit
VOM	Volt Ohmmeter
WW	Wire Wrap
XCVR	Transceiver
XMT	Transmit

INTRODUCTION

SECTION 1: INTRODUCTION

Content	Page

1 GENERAL

This section provides instructions on how to use the Craft Interface and how to use a document arranged in the Task Oriented Practice (TOP) format.

Information in this manual is divided into sections as listed below:

- **Section 1 – Introduction** (this section), provides instructions on how to use the Craft Interface and how to use a TOP document.
- **Section 2 – Operation and Maintenance**, contains NTPs, DLPs, TAPs, and TADs for installation, operation, and maintenance of the Soneplex Broadband System.
- **Section 3 – General Information**, located at the back of this manual provides information about warranty, repair, and support services.

2 USING THE CRAFT INTERFACE

After the initial installation of a Soneplex Broadband system, most testing and local operations are conducted with the Craft Interface through a VT-100 compatible terminal. This terminal is connected either to the front panel of the MPU plug-in module, or through a port located on the rear of the Soneplex Broadband chassis. Both of these connecting points provide a standard EIA-232C interface.

When you are configuring the Soneplex Broadband system, monitoring alarms, or clearing trouble, the TOP procedure guides you through a series of menu commands using the Craft Interface. The Main Menu on the Craft Interface lists all the major functions, while sub-menus further break down the functions. The menu structure is shown in Figure 1-1.

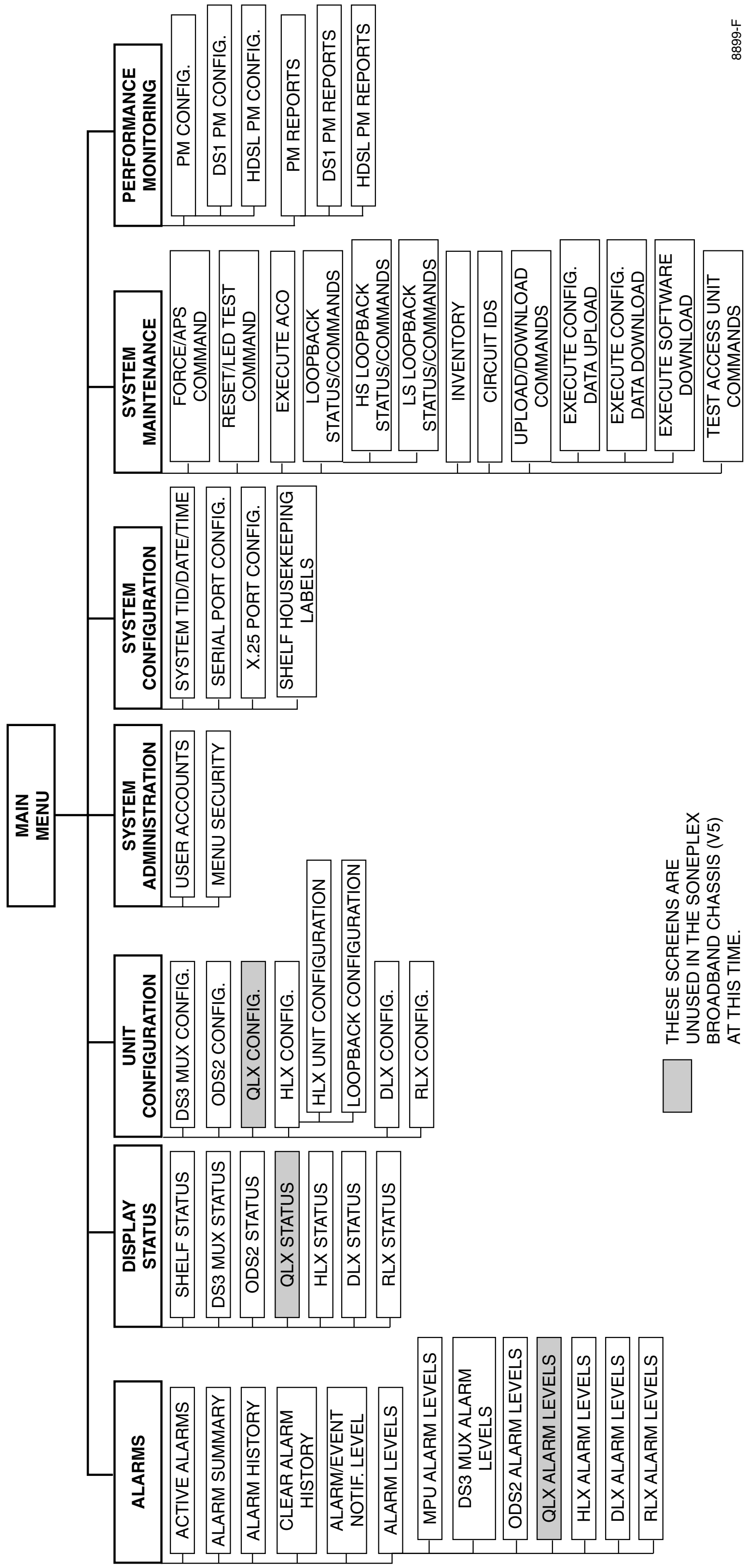

Figure 1-1. Soneplex Broadband (V5) Craft Interface Menu Tree

A logon is required to gain access to the Craft Interface. The logon remains active until either the operator logs off or a user-selectable period of keyboard inactivity is exceeded. The default time-out period is 30 minutes. Passwords are used to limit access to the system. When you enter your assigned User Name, the Soneplex Broadband system will request a password.

When you enter your assigned password, the Main Menu appears. It includes the current software version number (top right corner) and a copyright insignia. A default user ID and password are available for a newly installed system; but to ensure system security, these should be removed by the system administrator after the system is in operation.

3 EDITING FIELDS

The keyboard is used to select menus, view the various screens, and when necessary, to enter alpha and numeric information into the system. Keyboard operations make use of the alpha and numeric keys, arrow keys, enter or return key, space bar, and control key.

3.1 Cursor

In the Craft Interface system, a cursor is used to indicate menu selections, option settings, and data entry fields. The cursor may take the form of a block, a highlighted field, or a flashing line. When selecting a menu, the cursor is moved by pressing either the arrow or number keys. When selecting an option setting or making a data entry, the cursor is moved by pressing the arrow keys.

3.2 Arrow Keys

The arrow keys are used to move the cursor to indicate menu selections, option settings, and data entry fields. In screens that have more than one page, the up and down arrow keys also move the screen up or down one line at a time. In the same screens, the left arrow key moves the screen up one page and the right arrow key moves the screen down one page. Each time the screen is moved down one page, the last line from the previous screen is displayed as the first line on the new page. Each time the screen is moved up one page, the first line from the previous screen is displayed as the last line on the new page.

3.3 Enter and Return Keys

The Enter and Return keys causes the system to act on the data that was entered. Selections may be entered into the system in one of two ways:

1. By pressing an arrow key and then the Enter or Return key **once**.
2. By pressing the Enter or Return key **twice** after all selections and entries are made in the screen but before leaving the screen.

3.4 Space Bar

Pressing the space bar when the cursor is in a toggle field changes the item at the cursor. If the item is selected from a list of options, pressing the space bar brings up the next choice.

3.5 "R" Key

If you press the "R" key by itself when you are in a toggle field, the selection will revert to its previous value.

3.6 Control Key

Special functions are activated by pressing the Control key and another key at the same time, as shown in Table 1-1.

Table 1-1. Control Key Functions

HOLDING DOWN THE CONTROL KEY AND PRESSING...	RESULTS IN...
A	Display of the help screen
D	Termination of the session and logging the user out
P	Cancellation of the current operation and movement of the cursor to the previous menu
R	Cancellation of the current operation and refreshing (i.e., redrawing) of the current screen with the last saved values
T	Cancellation of the current operation and movement of the cursor to the Main Menu

3.7 Pop-Up Screens

In some areas of the Craft Interface, screens pop up presenting error data and information screens to assist you in operating the system. The information is displayed in a box that appears in front of the current screen display in reverse image (i.e., light on dark).

3.8 Help Screen

A help screen is available from all screens. Pressing CONTROL-A activates the help screen. The help screen displays information about moving among the fields and making edits.

3.9 Data Entry

Table 1-2 shows the different field types in the Craft Interface, and how to enter data in them. A "toggle" field type means the user can press the space bar and "R" key to view and select different options that are described. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

Table 1-2. Craft Interface Data Entry

FIELD STATUS				
FLASHING	**HIGHLIGHTED**	**FIELD TYPE**	**OPTION**	**DESCRIPTION**
Yes	Yes	Toggle	Press the space bar	Toggles forward through field options.
			Press the "R" key	Toggles backward through field options.
Yes	Yes	Input	Type any character	Overwrites the character at the cursor.
			Press Delete	Erases the character at the cursor.
Yes	Yes	Toggle or Input	Use any arrow key	• If **no** edit has been made: Moves the cursor to the next field. • If an edit **has** been made: Enters an edit without saving it and moves the cursor to another field.
			Press Enter once	If the arrow key has **not** been pressed: Stops the edit mode and enters the edit without saving it.
Yes	No	Toggle or Input	Press Enter once	If an edit **has** been made and Enter has already been pressed once: Pressing Enter again saves the edit.
No	No	Toggle or Input	N/A	• No edit has been made and the cursor is no longer in that field **or** • The edit has been saved using the arrow keys and pressing Enter once **or** • The edit has been saved by pressing Enter twice.

4 USING A TOP DOCUMENT

The procedures in this section are written in the Task Oriented Practice (TOP) format. The TOP method of presenting information provides step-by-step instructions for the successful completion of the indicated task. To find the instructions for performing enclosure installation, plug-in unit installation and initial turn-up, and installation troubleshooting tasks, follow these steps:

1. Find the task to be performed in the Task Index List (IXL-001).

2. Locate the specified director level, detail level, or trouble-clearing procedure. All procedures are in numerical order, regardless of type. The TOP procedures in this manual are of the following four types:
   - Non Trouble Clearing Procedure (NTP): A director level procedure that lists normal work items to be performed that are not trouble clearing procedures.
   - Trouble Analysis Procedure (TAP): A director level procedure that provides step-by-step instructions to locate and fix trouble.
   - Detailed Level Procedure (DLP): Detailed step-by-step instructions or procedures.
   - Trouble Analysis Data (TAD): A trouble-clearing aid containing non-procedural data.
3. Perform all the items in the director level procedure (NTP or TAP) in the order listed unless sent to another director level procedure. When a director level procedure is finished, the task is completed. When more detailed information is required, the reader will be sent to a DLP. A DLP may also direct the reader to another DLP.

Note: When a DLP is complete, return to the procedure that preceded the DLP.

Note: When sent from one director level procedure to another director level procedure, in most instances it will not be necessary to go back to the first director level procedure after competing the second.

4. In some procedures, it will be necessary to verify that certain responses have occurred. If the expected response is not observed, refer to the appropriate TAP. If additional data is required (such as a schematic diagram, line drawing, tabulated data, maintenance philosophy, or trouble-clearing strategy), the reader will be sent to a TAD.

OPERATION
AND MAINTENANCE

SECTION 2: OPERATION AND MAINTENANCE

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1 GENERAL

This section provides procedures to install and maintain a Soneplex Broadband system. The procedures are given in a Task Oriented Practice (TOP) format. Regardless of your work experience, TOP can be a useful tool in doing your job. If you have done a particular job many times, the TOP serves as a memory jogger for those instructions you cannot recall. If you have never done a particular job, or do it infrequently, a TOP provides step-by-step instructions to complete the task.

ALPHABETICAL TASK LIST

(continued)

ALPHABETICAL TASK LIST

(continued)

(continued)

ALPHABETICAL TASK LIST

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MODULE INSTALLATION AND TESTING PROCEDURES

Summary: This procedure provides instructions for installing the various modules in the installed chassis and verifying operation. Installation includes inspecting the chassis for proper installation, checking the power supply, inserting the modules into the chassis, and testing various functions. This procedure assumes that the Soneplex Broadband chassis and associated Heat Baffle/Fiber Management Panel are installed in the rack, and that all power, signal, and alarm cables are connected. This procedure must be performed before attempting to test or operate the entire circuit or system that will be using this equipment.

⚠ **Danger:** *To avoid electric shock, be careful when working near HDSL loop connections or telecommunications circuits. An electrical potential of ±130 volts exists on HDSL loop connections and telecommunications circuits. Coming in contact with this high electrical potential will result in death or severe personal injury.*

⚠ **Caution:** *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

Do Items Below in the Order Listed	For Details Go To
1. Obtain the following tools and equipment: • #2 or #3 Phillips-head screwdriver • Anti-static wrist strap • Digital volt ohmmeter (VOM) • Optical power meter (if installing ODS2 modules) • Standard hand tools • Two fiber optic patch cables (1 to 3 meters long each)	
2. Open Soneplex Broadband chassis front cover.	
3. Inspect the Soneplex Broadband chassis for proper installation and correct installation of all cables. Refer to the Soneplex Broadband System Chassis Installation Manual, listed under Related Publications at the beginning of this manual, for more information.	
4. If required, unpack modules from their shipping container (they may be stored in the chassis). Inspect for damage or missing parts.	DLP-500

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Do Items Below in the Order Listed	For Details Go To
5. Familiarize yourself with the Soneplex Broadband chassis, module locations, and wiring points.	DLP-501
6. Verify that –48 VDC is present at the power supply terminal block located on the chassis backplane.	DLP-508
7. If specified in the work order, install and test the MPU module:	
• Install a new MPU module in a non-provisioned chassis, and verify stand-alone operation.	DLP-502
• Remove an MPU from an existing chassis, install it in another chassis, and verify stand-alone operation.	DLP-519
8. Install and test APU module.	DLP-503
9. Install and test the working DS3 MUX module in the MXW slot of the Soneplex Broadband chassis. If required, install the protect DS3 MUX in the MXP slot. In an unprotected system, the DS3 MUX module must be installed in the working slot.	DLP-505
10. Install and test Version C, D, E, or G HLXC module(s).	DLP-516
11. Perform end-to-end tests between the HLXC and the HLXR.	DLP-520
12. Install and test DLX module(s).	DLP-521
13. Perform DLX-equipped circuit end-to-end tests.	DLP-522
14a. Install and test RLX module(s).	DLP-525
AND/OR	
14b. Install and test RLXIOR module(s).	DLP-524
15. Perform RLX-equipped circuit end-to-end tests.	DLP-522
16. Install and test ODS2 module(s). Install the Working ODS2 module first, then the Protection module. In an unprotected system, the ODS2 module must be installed in the working slot.	DLP-506
17. Install and test the Remote Test Access Unit (RTAU).	DLP-517

Do Items Below in the Order Listed	For Details Go To
Note: For information about installing and testing the Remote Test Access Unit (RTAU), which is used with MPU Software Version 5.3, refer to the Soneplex RTAU (Remote Test Access Unit) Installation Instructions manual, listed under Related Publications at the beginning of this manual.	
18. Install and test the Streaker (STK) module (if present).	DLP-571
19. Complete assignment forms and update office records as required by local procedures.	DLP-523
20. Close the chassis front cover when installation of modules is complete. The chassis may remain powered up unless otherwise directed in the work order.	

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ODS2 MODULE AND REMOTE SYSTEM END-TO-END TEST PROCEDURES

Summary: This procedure tells how to connect a Craft Interface device to the Soneplex equipment and configure ODS2 modules. It also tells how to connect test equipment, and how to perform an end-to-end test of a Soneplex system with ODS2 modules. Protection switching tests are also provided in case protect modules are employed in the system. The procedure assumes the equipment in the Soneplex chassis and at the remote Fiber Loop Converter has been installed and has passed local tests. It also assumes that fiber has been installed at both ends and the circuit connection is complete. This procedure must be performed before attempting to operate the entire circuit or system that will be using this equipment.

⚠ **Danger**: *Do not look into the ends of any optical fiber, or look directly into the module fiber connectors. Exposure to invisible laser radiation may result, which can damage the retina of the eye. An optical power meter should be used to verify active fibers.*

⚠ **Danger**: *To avoid electric shock, be careful when working near HDSL loop connections or telecommunications circuits. An electrical potential of ±130 volts exists on HDSL loop connections and telecommunications circuits. Coming in contact with this high electrical potential will result in death or severe personal injury.*

Do Items Below in the Order Listed	For Details Go To

1. Obtain the following tools and equipment:
   - Anti-static wrist strap
   - DS3 test set with DS1 option (for central office end of the circuit)
   - DS1 test set (for remote end of the circuit)
   - VT-100 compatible terminal or computer with terminal emulation software
2. Coordinate test with a technician located at the remote end of the circuit and ensure test procedures there have been completed. Refer to the Quad DS1 Fiber Loop Converter (B2/B3/D3) User Manual, and the Quad Loop Extender (QLX) Operation and Maintenance Manual, listed under Related Publications at the beginning of this manual, for more information.
3. At both ends of the circuit, make any necessary cross-connects at the optical patch panel (if used).
4. Open the chassis front cover.

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Do Items Below in the Order Listed	For Details Go To
5. Momentarily press the LMPTST switch on the APU front panel and verify that all indicators light.	
6. Connect terminal equipment to Craft port on the front of the MPU.	DLP-504
7. Log on to the Craft Interface.	DLP-526
8. Clear Alarm History.	DLP-527
9. Enter Target Identifier and set date and time now or during provisioning (the turn-up process).	DLP-528
10. Configure DS3 MUX as required.	DLP-529
11. Configure ODS2 modules as required.	DLP-530
12. Clean and mate fiber optic connectors and adapters as required.	DLP-507
13. Connect the test equipment at both ends of the system and perform an end-to-end test between the Soneplex chassis and the remote module.	DLP-510
14. If the Soneplex system being tested is equipped with protection modules:	
Execute Force/APS commands through the Craft Interface.	DLP-537
Perform Manual (Force) Switch to Protect test on DS3 MUX module.	DLP-511
Perform APS test on DS3 MUX module.	DLP-512
Perform Manual (Force) Switch to Protect Test on ODS2 module.	DLP-513
Perform APS test on ODS2 module.	DLP-514
15. Log off from the Craft Interface system.	DLP-564
16. Complete assignment forms and update office records as required by local procedures.	DLP-523

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SYSTEM OR CIRCUIT PROVISIONING PROCEDURES

Summary: This procedure tells how to provision (turn-up) a new Soneplex system or circuit using the Craft Interface. The procedure assumes the equipment in the Soneplex chassis and the equipment at the other end of the circuit has been installed, and has passed all local and end-to-end tests. Some procedures may not be required and will depend upon how the system is equipped. This procedure must be performed before attempting to operate the entire circuit or system that will be using this equipment.

Do Items Below	For Details Go To
1. Log on to the Craft Interface.	DLP-526
2. Clear Alarm History (required only for a new installation).	DLP-527
3. Set system date and time, and enter the Target Identifier.	DLP-528
4. Set Craft Interface port configuration:	
• For Craft Port on MPU or Port 2	DLP-549
• For X.25 Port	DLP-558
5. Edit Menu Security (set privilege levels).	DLP-536
6. Edit User Accounts (set user IDs and passwords).	DLP-535
7. Assign names to Housekeeping Alarm contacts.	DLP-550
8. Configure the DS3 MUX as required, set service state, and set protect status. If required, insert Line Build-Out on the transmit side of the DS3 signal.	DLP-529
9. If present, equip ODS2 modules; assign service state and line code for each DS1 on the ODS2 module.	DLP-530
10. If present, equip Version C, D, E, or G HLXC modules and provision HDSL circuits.	DLP-516
11. If present, equip DLX modules and provision DS1 circuits.	DLP-532
12a. If present, equip RLX modules and provision DS1 circuits.	DLP-534
AND/OR	
12b. If present, equip RLXIOR modules and provision DS1 circuits.	DLP-533
13. Assign performance monitoring thresholds for each DS1 in the system.	DLP-556

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Do Items Below	For Details Go To
14. If equipped, assign performance monitoring thresholds for each HDSL facility in the system.	DLP-557
15. Set alarm/event notification level.	DLP-552
16. Set MPU alarm levels.	DLP-559
17. Set DS3 MUX alarm levels.	DLP-560
18. If equipped, set ODS2 alarm levels.	DLP-561
19. If equipped, set HLX alarm levels.	DLP-562
20. If equipped, set DLX alarm levels.	DLP-563
21. If equipped, set RLX alarm levels.	DLP-518
22. Log off the Craft Interface.	DLP-564
23. Complete assignment forms and update office records as required by local procedures.	DLP-523

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MAINTENANCE PROCEDURES

Summary: The following procedures can be used for maintenance for a Soneplex Broadband system. These procedures use the Craft Interface. They do not have to be performed in any particular order except logging on and logging off.

Do Items Below As Required	For Details Go To
Craft Interface System Logon	DLP-526
Access Identifier	TAD-106
ACO (Alarm Cutoff) Command	DLP-539
Alarm History Display	DLP-544
Alarm Summary Display	DLP-543
Alarm Troubleshooting	TAP-101
Circuit ID Display	DLP-566
DLX Status Display	DLP-553
DS3 MUX Status Display	DLP-546
HLX and HRX Status Display	DLP-548
HLX Loopback Configuration	DLP-573
Local Craft Interface Connection Troubleshooting	TAP-103
Loopback Process Description	TAD-102
Loopback Status/Commands	DLP-541
Maintenance Philosophy	TAD-100
ODS2 Module Status Display	DLP-547
Performance Monitoring Reporting Locations	TAD-103
Performance Monitoring Reports Description	TAP-102
Performance Monitoring Reports Retrieval	DLP-565
Reset/LED Test Commands	DLP-538
RLX and RLXIOR Status Display	DLP-509
Shelf Housekeeping Alarm Labels	DLP-550
Shelf Status Display	DLP-545
Specifications	TAD-101
RTAU Operation	DLP-570

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Do Items Below As Required	For Details Go To

➧ **Note:** For information about installing, testing, and operating the Remote Test Access Unit (RTAU), which is used with MPU Software Version 5.3, refer to the Soneplex RTAU (Remote Test Access Unit) Installation Instructions manual, listed under Related Publications at the beginning of this manual.

TAU Operation	DLP-575
TBOS Chassis Daisy-Chaining	DLP-576
TBOS Interface Description	TAD-104
Transaction Language 1 (TL1) Interface Description	TAD-105
Version C HLXC to HLXR Voltage and Current Test	DLP-568
Version D (or Later) HLXC to HLXR Voltage and Current Test	DLP-572
Craft Interface System Logoff	DLP-564

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ALARMS PROCEDURES

Summary: The following procedures can be used to display alarms and locate trouble in a Soneplex system using the Craft Interface device. They may be performed in any order.

Do Items Below As Required	For Details Go To
Active Alarms Display	DLP-542
Alarm History Clearance Command	DLP-527
Alarm History Display	DLP-544
Alarm Summary Display	DLP-543

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MPU VERSION 5.3 SOFTWARE INSTALLATION AND TESTING PROCEDURES

Summary: This procedure is used to install MPU Version 5.3 software on an MPU. To perform this procedure, a host computer with VT-100 emulation and XMODEM file transfer capability is required. The application software requires 12 to 17 minutes to transfer depending on the type of host computer and the communication program used. MPU Version 5.3 software can only be downloaded to MPU Version 5.3 hardware.

Do Items Below in the Order Listed	For Details Go To
1. The following tools and equipment are required to perform this procedure: • Host computer system with VT-100 emulation • PC communication software with VT-100 emulation and with XMODEM file transfer capability • MPU Version 5.3 application software and download software (provided on diskette) • Straight through EIA-232 cable (for Craft port on MPU) or null-modem cable (for Port 2 or 3 on chassis back panel)	
2. Connect the host computer to chassis port configured as the Craft port. Turn the power on.	DLP-504
3. Insert the diskette with MPU Version 5.3 software and the database equalization software into the computer disk drive.	
4. Log on to the Craft Interface system.	DLP-526
5. Download the MPU Version 5.3 software program and verify that transfer is successfully completed.	DLP-551
6. If no additional operations are required, log off from the Craft Interface.	DLP-564

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MPU CONFIGURATION DATA SAVE AND TRANSFER PROCEDURES

Summary: This procedure is used to save the configuration data from an installed MPU and then transfer it to another MPU. A host computer containing software that can emulate a VT-100 terminal and perform XMODEM file transfers is required.

Do Items Below in the Order Listed	For Details Go To
Note: Any configuration database from an MPU with Version 3.1 or later software can be downloaded to an MPU with Version 5 software. When downloading to an MPU that is not running Version 5 software, the MPU software version of the source MPU must match the software version of the destination MPU.	
1. The following tools and equipment are required to perform this procedure: • Host computer system • VT-100 emulator program with XMODEM file transfer capability • MPU Version 5 application software. • MPU hardware with Boot Code Version 2.0 or later • Straight-through RS-232 cable (for Craft port on MPU) or null-modem cable (for Port 2 on chassis back panel)	
2. Connect host computer to either the Craft port on the MPU or Port 2 on the chassis back panel. Turn host computer power on.	DLP-504
3. Insert a diskette into the computer disk drive.	
4. Log on to the Craft Interface system.	DLP-526
5. Perform the Configuration Upload command and transfer the configuration data to the host computer.	DLP-554
6. Replace the MPU or connect host computer to another MPU.	DLP-519
7. At the new MPU, repeat Steps 4 and 5, then select the Execute Configuration Data Download command and transfer the configuration data from the host computer to the new MPU.	DLP-555
8. If additional operations are not required, log off the Craft Interface.	DLP-564

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HLXC AND REMOTE SYSTEM END-TO-END TEST PROCEDURES

Summary: This procedure provides instructions for performing end-to-end tests between a central office Version C, D, E, or G HLXC module and a remote Version E or Version D HLXR module. Performing an end-to-end test includes connecting the cross-connect jumper wires, verifying that the HDSL loops synchronize, and then sending a test signal between the two systems. This procedure assumes that installation of the HLXC modules, the remote module enclosure, and the remote HLXR module is complete. This procedure must be performed before attempting to operate the entire circuit or system that will be using this equipment.

Danger: *To avoid electric shock, be careful when working near HDSL loop connections or telecommunications circuits. An electrical potential of ±130 volts exists on HDSL loop connections and telecommunications circuits. Coming in contact with this high electrical potential will result in death or severe personal injury.*

Warning: *To prevent electrical shock, never install telephone equipment in a wet location or during a lightning storm. When installing or modifying telephone lines, disconnect lines on the network side before working with uninsulated lines or terminals.*

Caution: *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

Note: Two technicians are required to perform this procedure, one at the central office and one at the remote location. Turn-up tests for the remote HLXR module should be done at the remote site following completion of stand-alone testing at the central office.

Do Items Below in The Order Listed	For Details Go To

1. Obtain the following tools and equipment:
   - Anti-static wrist strap
   - DS3 test set with DS1 option (for central office end of the circuit)
   - DS1 test set (for remote end of the circuit)
   - VT-100 compatible terminal or computer with terminal emulation software
2. Coordinate test with a technician located at the remote end of the circuit and ensure test procedures there have been completed.
3. Open the chassis front cover.

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Do Items Below in The Order Listed	For Details Go To
4. Momentarily press the LMPTST switch on the APU front panel and verify that all indicators light.	
5. Connect terminal equipment to Craft port on the front of the MPU.	DLP-504
6. Log on to the Craft Interface.	DLP-526
7. Clear Alarm History.	DLP-527
8. Enter Target Identifier and set date and time now or during provisioning (the turn-up process).	DLP-528
9. Configure DS3 MUX as required.	DLP-529
10. Configure HLXC modules as required.	DLP-531
11. Check the HLXC to HLXR voltage and current:	
• Version C HLXC to HLXR Voltage and Current Test.	DLP-568
• Version D (or Later) HLXC to HLXR Voltage and Current Test.	DLP-572
12. Connect the test equipment at both ends of the system and perform an end-to-end test between the chassis and the remote HLXR.	DLP-520
13. If the DS3 MUX protect module is installed:	
• Execute Force/APS commands through the Craft Interface.	DLP-537
• Perform Manual (Force) Switch to Protect test on DS3 MUX module.	DLP-511
• Perform APS test on DS3 MUX module.	DLP-512
14. Coordinate the test with a technician located at the remote end of the circuit and ensure test procedures there have been completed. Refer to the Soneplex Version D HLXR Remote System Operation and Maintenance Manual, listed under Related Publications at the beginning of this manual.	
15. At both ends of the circuit, make any necessary cross-connects at the distribution frames.	DLP-515
16. Log off from the Craft Interface system.	DLP-564
17. Complete assignment forms and update office records as required by local procedures.	DLP-523

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DLX AND REMOTE SYSTEM END-TO-END TEST PROCEDURES

Summary: This procedure provides instructions for performing end-to-end tests between the DLX modules and the remote system. Performing an end-to-end test includes connecting the cross-connect jumper wires, and then sending a test signal between the chassis and the network equipment. This procedure assumes that the T1 facility between the Soneplex Broadband chassis and network equipment (e.g., DLC, channel bank, etc.) is functional, and that the DLX modules to be tested have already been installed. This procedure must be performed before attempting to operate the entire circuit or system that will be using this equipment.

⚠ **Warning:** *To prevent electrical shock, never install telephone equipment in a wet location or during a lightning storm. When installing or modifying telephone lines, disconnect lines on the network side before working with uninsulated lines or terminals.*

⚠ **Caution:** *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

Do Items Below in The Order Listed	For Details Go To
1. Obtain the following tools and equipment: • Anti-static wrist strap • DS3 test set with DS1 option (for central office end of the circuit) • DS1 test set (for remote end of the circuit) • VT-100 compatible terminal or computer with terminal emulation software	
2. Coordinate test with a technician located at the remote end of the circuit and ensure test procedures there have been completed.	
3. Open the chassis front cover.	
4. Momentarily press the LMPTST switch on the APU front panel and verify that all indicators light.	
5. Connect terminal equipment to Craft port on the front of the MPU.	DLP-504
6. Log on to the system.	DLP-526

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Do Items Below in The Order Listed	For Details Go To
7. Clear Alarm History.	DLP-527
8. Enter Target Identifier and set date and time now or during provisioning (the turn-up process).	DLP-528
9. Configure DS3 MUX as required.	DLP-529
10. Configure DLX modules as required.	DLP-532
11. Connect the test equipment at both ends of the system and perform an end-to-end test.	DLP-522
12. If the DS3 MUX protect module is installed:	
• Execute Force/APS commands through the Craft Interface.	DLP-537
• Perform Manual (Force) Switch to Protect test on DS3 MUX module.	DLP-511
• Perform APS test on DS3 MUX module.	DLP-512
13. Make any necessary cross-connects at the DSX.	
14. Log off from the Craft Interface system.	DLP-564
15. Complete assignment forms and update office records as required by local procedures.	DLP-523

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RLX (OR RLXIOR) AND REMOTE SYSTEM END-TO-END TEST PROCEDURES

Summary: This procedure provides instructions for performing end-to-end tests between the Version A or Version B RLX modules, or RLXIOR modules, and the remote system. Performing an end-to-end test includes connecting the cross-connect jumper wires, and then sending a test signal between the two systems. This procedure assumes that the T1 facility between the central office and the repeater is functional, and that the RLX modules to be tested have already been installed. This procedure must be performed before attempting to operate the entire circuit or system that will be using this equipment.

⚠ **Warning:** *To prevent electrical shock, never install telephone equipment in a wet location or during a lightning storm. When installing or modifying telephone lines, disconnect lines on the network side before working with uninsulated lines or terminals.*

⚠ **Caution:** *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

Do Items Below in The Order Listed	For Details Go To
1. Obtain the following tools and equipment: • Anti-static wrist strap • DS3 test set with DS1 option (for central office end of the circuit) • DS1 digital transmission test set (T-Berd 211 or equivalent) • VT-100 compatible terminal or computer with terminal emulation software	
2. Coordinate test with a technician located at the remote end of the circuit and ensure test procedures there have been completed.	
3. Open the chassis front cover.	
4. Momentarily press the LMPTST switch on the APU front panel and verify that all indicators light.	
5. Connect terminal equipment to Craft port on the front of the MPU.	DLP-504
6. Log on to the system.	DLP-526

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Do Items Below in The Order Listed	For Details Go To
7. Clear Alarm History.	DLP-527
8. Enter Target Identifier and set date and time now or during provisioning (the turn-up process).	DLP-528
9. Configure DS3 MUX as required.	DLP-529
10. Configure RLX or RLXIOR modules as required.	DLP-534 or DLP-533
11. Check RLX voltage to repeater.	DLP-567
12. Connect the test equipment at both ends of the system and perform an end-to-end test.	DLP-522
13. If the DS3 MUX protect module is installed:	
• Execute Force/APS commands through the Craft Interface.	DLP-537
• Perform Manual (Force) Switch to Protect test on DS3 MUX module.	DLP-511
• Perform APS test on DS3 MUX module.	DLP-512
14. At both ends of the circuit, make any necessary cross-connects at the DSX.	DLP-569
15. Log off from the Craft Interface system.	DLP-564
16. Complete assignment forms and update office records as required by local procedures.	DLP-523

SYSTEM COMPONENTS INSPECTION

Summary: This procedure provides instructions for opening the shipping cartons, verifying that the correct components and quantities were received, and checking for damages.

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

1. The following tools and equipment are required for unpacking:
   - ESD wristband
   - Box cutter
2. Open the shipping carton and carefully unpack the equipment from the protective packing material.
3. Check each component against the packing list to verify that the correct catalog numbers and quantities were received. Verify that all parts are received before discarding the shipping containers and packing material in case a return is necessary.
4. Inspect the components for broken or bent wire wrap pins on the chassis backplane. Check the BNC connectors on the backplane to ensure that they are securely fastened.
5. Inspect each module for broken or damaged indicators and switches.
6. Does your work order call for you to store the modules in the chassis?
   - If No, return the modules to their containers and store them securely for later use.
   - If Yes, when the chassis is installed, slide the modules loosely into their slot locations on the chassis. Do not plug them into the chassis.
7. If there are any damaged or missing parts, file a claim with the commercial carrier. Contact ADC Telecommunications for replacement parts. See the General Information section of this manual for procedures.

Stop! You have completed this procedure.

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CHASSIS INSPECTION

Summary: This procedure provides instructions for identifying the Soneplex Broadband chassis and module locations. The chassis front and locations for modules are shown in Figure 501-1. The chassis backplane is shown in Figure 501-2.

1. See Figure 501-1 to identify module locations at the front of the chassis. A working DS3 MUX module, an APU, and an MPU are always required. The slots identified for low-speed modules can house:
   - Up to 14 ODS2 modules (7 working and 7 protect),
   - 28 HLXC modules,
   - 28 DLX modules,
   - 28 RLX modules, or
   - Any combination up to a maximum of 28 DS1 circuits.
2. See Figure 501-2 to identify components and locations on the chassis backplane.

Stop! You have completed this procedure.

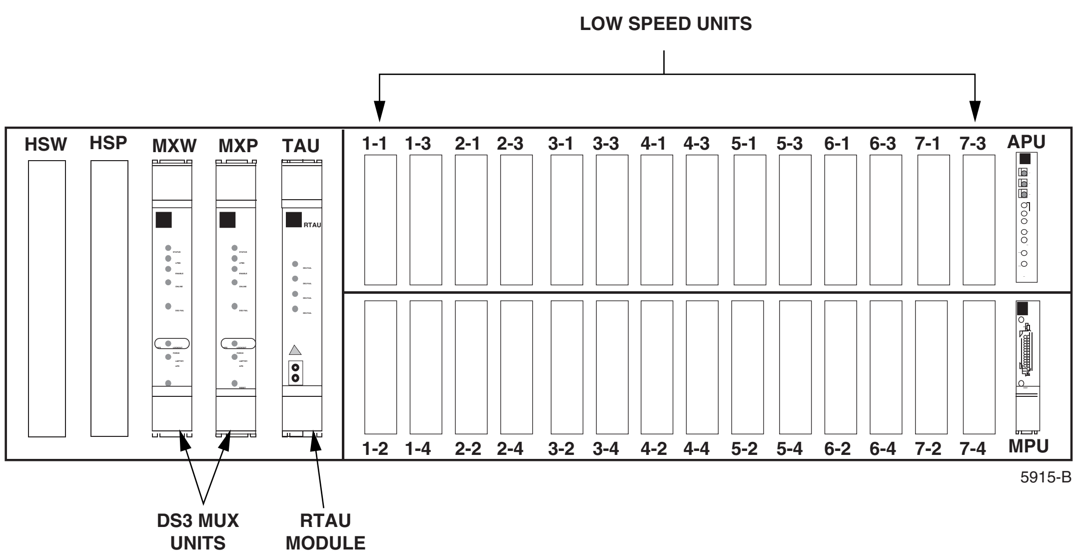

Figure 501-1. Soneplex Broadband Chassis, Front View

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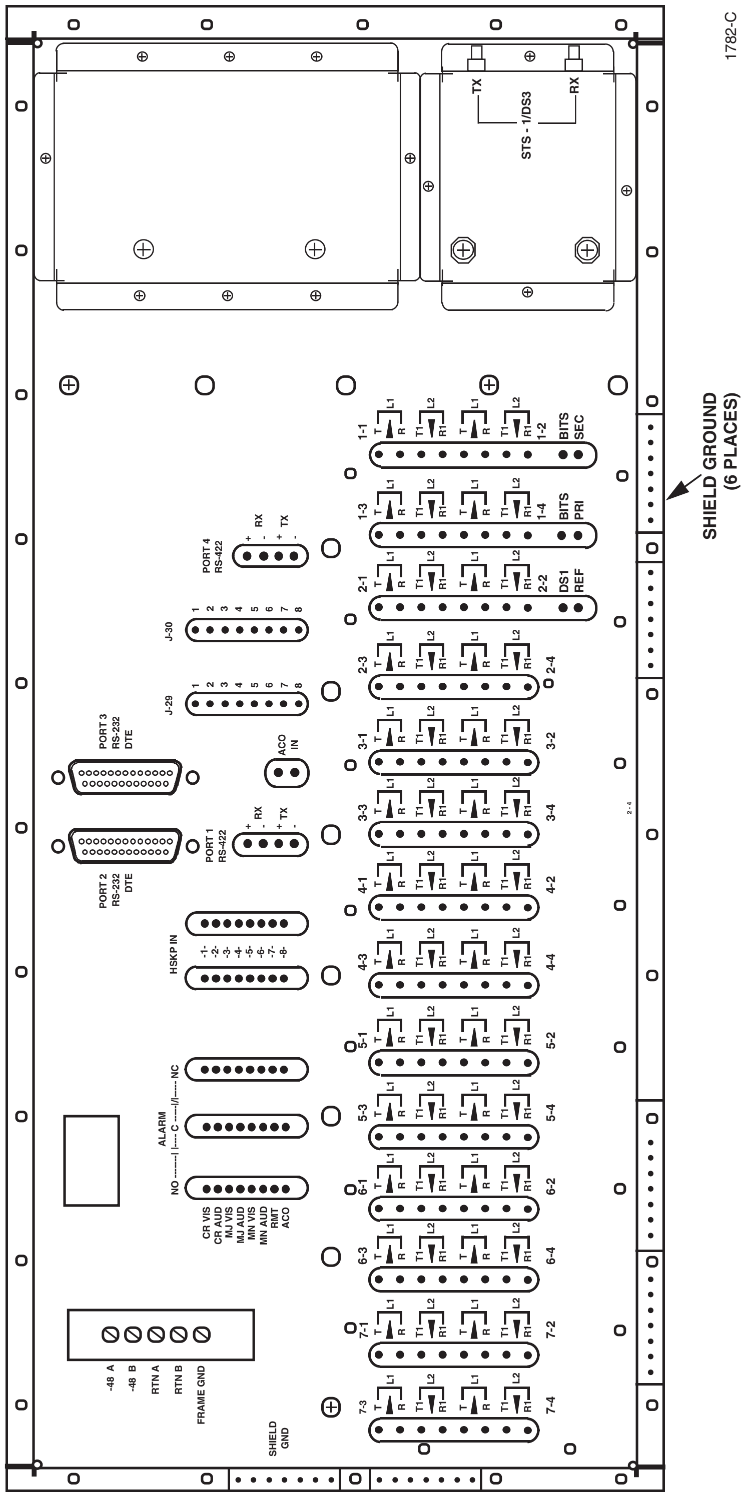

Figure 501-2. Soneplex Broadband Chassis Backplane

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MPU INSTALLATION AND TESTING

Summary: This procedure provides instructions on unpacking and installing a new MPU in a non-provisioned chassis, and then verifying that it is functioning properly.

Caution: *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. An ESD grounding post is located on the chassis for connecting the ESD wrist band. Ensure that all modules removed from the equipment or not installed, are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

Note: When installing a new MPU module, use the same DIP switch settings on the MPU's printed circuit board as the DS3 MUX's DIP switch settings. Keeping both switch settings the same enables communication between the MPU and the DS3 MUX for OAM&P.

Note: When replacing an MPU in a configured chassis, the configuration data from the modules in the chassis is automatically loaded into the new MPU. If an MPU from a provisioned chassis is *moved* to another chassis, the chassis unit configurations may not match the MPU unit configurations, resulting in alarms and erroneous information. Refer to DLP-519 (Replace MPU and Verify Stand-Alone Operation) for more information.

1. Open the shipping carton and carefully unpack the MPU from its protective packaging.

   Note: DO NOT change any DIP switch settings on the printed circuit board of the MPU; this could make the MPU incompatible with your Soneplex Broadband system.

2. Refer to Figure 502-1 for a drawing showing the MPU module slot in the chassis. Align the edges of the printed circuit card with the card guides in the chassis.

3. Using the ejector, push the MPU into the slot marked MPU located in the lower right corner of the chassis until it is firmly seated in the connector. If there is excessive resistance, remove the module and check for improper alignment or obstructions.

4. Use the screw to secure the MPU to chassis.

5. Refer to Figure 502-2 for a drawing of the MPU front panel. Verify that STATUS indicator lights red, then yellow, and then remains green.

6. If STATUS indicator is not lit (i.e., green), check for A and B power at the connections on the backplane.

   Reference: DLP-508 –48 VDC Power Supply Test

7. If there is power at both of the connections (A and B), remove and replace the MPU with a new one.

8. If STATUS indicator is red, this indicates an MPU hardware failure. Remove and replace the MPU with a new one.

Stop! You have completed this procedure.

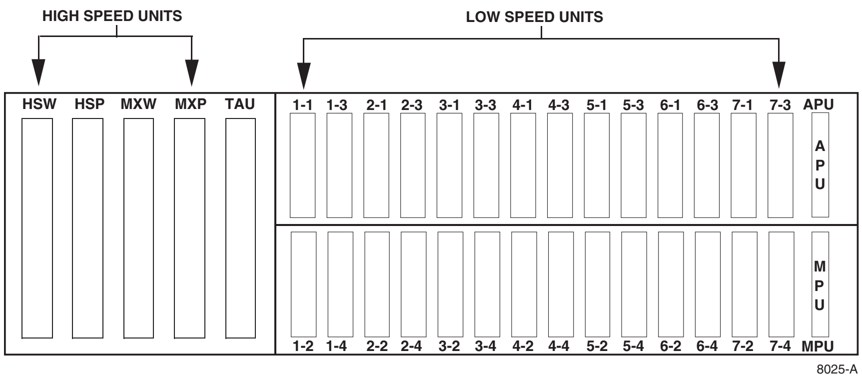

Figure 502-1. Soneplex Broadband Chassis (Front View) Mounting Slot for MPU

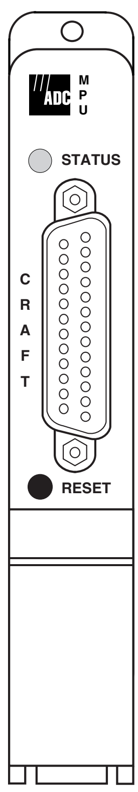

Figure 502-2. MPU Front Panel

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APU INSTALLATION AND TESTING

Summary: This procedure provides guidelines for installing and testing the APU.

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. An ESD grounding post is located on the chassis for connecting the ESD wrist band. Ensure that all modules removed from the equipment or not installed, are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

1. Remove the APU from protective packaging.
2. Push the APU into slot marked APU located in the upper right corner of the chassis.
3. Use screw to secure the APU to chassis.
4. If PWR indicator is not lighted at all, check for power at the A and B connections on the backplane.

   Reference: DLP-508 –48 VDC Power Supply Test
5. If there is power at both of the connections (A and B), remove and replace the APU with a new one.
6. Press the LMPTST switch to verify that all APU indicators light. If any indicator does not light, replace the APU.

Stop! You have completed this procedure.

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LOCAL CRAFT INTERFACE CONNECTION

Summary: This procedure provides instructions for accessing the Craft Interface. It can be accessed locally from a VT-100 compatible terminal or a host computer connected to either the front or rear of the Soneplex Broadband chassis.

1. Locate the port that will be used to connect the control terminal or host computer to the Craft Interface. The MPU Craft port is located on the front of the MPU as shown in Figure 504-1 and is configured as a DCE connection. Ports 2 and 3 are located on the chassis rear panel and are configured as DTE connections.

2. Select the cable that is required for connecting the terminal or computer to the chassis. Maximum length of the cable is specified by the EIA-232 protocol. A straight-through, 25-pin, connectorized EIA-232 cable is required to connect the terminal or computer to the MPU Craft port. Pin-out information for the MPU Craft port is shown in Table 504-1. A null-modem cable or adapter is required to connect the terminal or computer to Port 2 or Port 3. Ports 2 and 3 provide an EIA-232 interface and use 25-pin D-subminiature female connectors for the cable connections.

3. Connect one end of the cable to the terminal or computer and the other end to the appropriate port.

4. Turn on the power to the terminal or computer. If using a computer, enter the communications software package resident on the computer. Serial port default settings are listed in Table 549-1.

   Reference: DLP-549 Serial Port Configuration

5. Press Enter or Return.

6. The Logon screen with User Name field should appear.

Stop! You have completed this procedure.

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Table 504-1. MPU Craft Port Wiring

PIN	NAME	SOURCE	CIRCUIT CCITT	CIRCUIT EIA	FUNCTION
1	FG	–	101	AA	Frame Ground
2	TD	DTE	103	BA	Transmitted Data
3	RD	DCE	104	BB	Received Data
7	SG	–	102	AB	Signal Ground

Cable uses Type DB-25 Male connector.
Overall shielding, common for all leads.
Use 26 AWG or larger wire, stranded pairs.

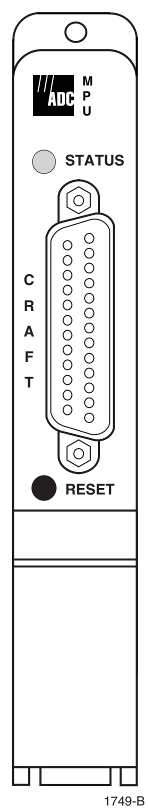

Figure 504-1. MPU Front Panel

DS3 MUX INSTALLATION AND TESTING

Summary: This procedure describes how to install working and protect D1 DS3 MUX modules in the Soneplex Broadband chassis, as well as how to troubleshoot the installation.

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. An ESD grounding post is located on the chassis for connecting the ESD wrist band. Ensure that all modules removed from the equipment or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

1. Remove D1 DS3 MUX from protective packaging.

2. Refer to Figure 505-1 for DS3 MUX module locations.

3. Using the ejectors, fully seat the D1 DS3 MUX in the slot labeled MXW. Because of the large connector on the back of this module, a significant amount of force is required to properly seat the module in the backplane connector.

4. Verify the following:
   - The STATUS indicators first appeared red, turned yellow, and now remain green.
   - The ONLINE indicator is lighted green.
   - The DS3 LOS indicator is lighted red (indicating a lack of DS3 signal).

   If these three conditions are met, continue to Step 5.

   If not, replace the D1 DS3 MUX and return to Step 1.

5. On the APU, press LMPTST/APS switch.

   If all DS3 MUX indicators light, continue to Step 6.

   If not, replace the D1 DS3 MUX and return to Step 1.

6. If this system is to be configured as DS3 Protected, continue to Step 7.

   If not, **Stop! You have completed this procedure**.

7. Remove a D1 DS3 MUX from protective packaging and inspect the module for damage.

➧ **Note:** The online indicator will not light green for the Protect DS3 MUX. Only one module at a time can be "online".

8. Install the D1 DS3 MUX in the chassis slot labeled MXP.

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9. Repeat Steps 3 through 5, then **Stop! You have completed this procedure**.

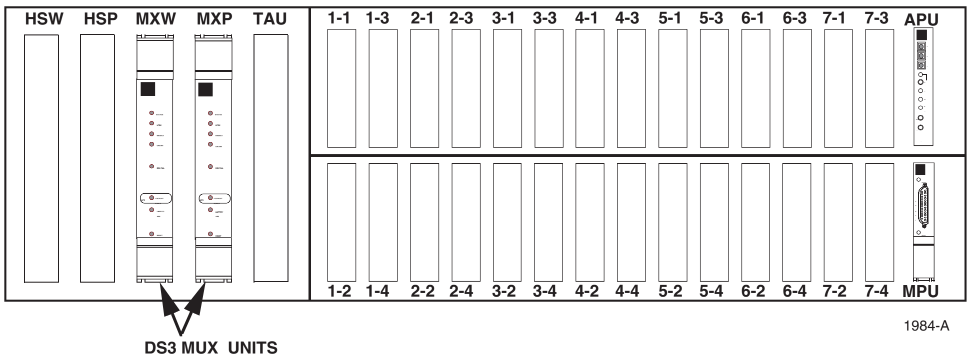

Figure 505-1. DS3 MUX Locations

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ODS2 MODULE INSTALLATION AND TESTING

Summary: This procedure describes how to install working and protect ODS2 modules in the Soneplex Broadband chassis, as well as how to troubleshoot the installation. The working ODS2 module must be installed before the protect ODS2 module.

Safety Considerations

Sufficient invisible infrared energy can be emitted from the end of an active fiber or operational transmitter to seriously damage the retina of the eye. Danger labels located on the chassis, alert you to the potential of exposure to invisible laser radiation. Observe the procedures described in the following Danger notice.

⚠ **Danger:** *Do not look into the ends of any optical fiber. Exposure to invisible laser radiation may result. An optical power meter should be used to verify active fibers. Do not look directly into the module fiber connectors. Exposure to invisible laser radiation may result.*

⚠ **Warning:** *Do not insert module edge connectors into the chassis connectors before connecting the optical fiber to the module. Exposure to invisible laser radiation may occur if the module edge connectors are allowed to connect with the chassis connectors before connecting the optical fiber to the module. Verify that all indicators are dark (off) and the module is not engaged with the chassis connectors before proceeding.*

⚠ **Caution:** *The ODS2 module MUST be unequipped when it is in the chassis with the optical loopback patch cord; otherwise, the Craft Interface will not function properly when accessing the module. Before seating the ODS2 module in the chassis, check the ODS2 Configuration screen to be sure that the module's Unit Equip State is set to UNEQUIPPED.*

⚠ **Caution:** *Always allow sufficient fiber length to permit routing without severe bends. Fibers may be permanently damaged if bent/curved to a radius of less than 1.5 inches (3.81 cm).*

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. An ESD grounding post is located on the chassis for connecting the ESD wrist band. Ensure that all modules removed from the equipment or not installed, are properly stored in anti-static packing material. When working with modules, always place the modules on an electrically-grounded, approved, anti-static mat.*

➧ **Note:** When using ODS2 modules in a group, NEVER install other Soneplex modules (RLX, DLX, or HLXC) in any of the unused slots in the group.

1. The fibers should have been placed in the rack when the chassis was installed. Route the fibers through the fiber management baffle into the top of the chassis to the ODS2 module locations. Protective covers must be in place on the fiber connectors to prevent dust and damage to the connections. The fibers should be tagged to identify the circuit and the transmission direction.

2. Select the ODS2 module. If the module is not already installed, remove the module from the protective ESD packaging. If ODS2 module is installed, remove it and inspect for physical damage.

3. Refer to Figure 506-1 for ODS2 module locations. Then refer to Table 506-1 and your work order for slots to be used. Working ODS2 modules are always installed in the top odd slots (1-1, 2-1, 3-1, 4-1, 5-1, 6-1, and 7-1). Protection ODS2 modules are installed in the adjoining odd numbered slots (1-3, 2-3, 3-3, 4-3, 5-3, 6-3, and 7-3).

   Reference: TAD-106 Access Identifier

4. Insert the working ODS2 module first. Align the module with the slots and slide module into the chassis until the two fiber connectors protrude about three inches out from the front of the chassis. Do not seat module in connector at this time.

5. Remove the protective dust caps from the transmit and receive connectors on the ODS2 module.

6. Remove the protective covers from the fibers.

7. Clean fiber optic connectors and adapters.

   Reference: DLP-507 Fiber Optic Connector and Adapter Cleaning and Mating Instructions

8. Connect a fiber optic patch cord between the transmit and receive connector on the ODS2 module. See Figure 506-2. This sets the configuration of the module in optical loopback.

9. Using the ODS2 module ejector, press the module into the chassis until it is properly seated.

10. On the APU, press LMPTST/APS switch. Did all ODS2 indicators light?
    - If **Yes**, continue to Step 11.
    - If **No**, replace ODS2 module and go to Step 4.

11. Is the STATUS indicator on the ODS2 module lighted green?
    - If **Yes**, continue to Step 12.
    - If **No**, replace ODS2 module and go to Step 4.

12. Is the OPT FAIL indicator lighted red?
    - If **Yes**, check the patch cord connection. If indicator remains lighted, replace the ODS2 module and go to Step 4.
    - If **No**, go to Step 13.

13. Pull the ODS2 module out far enough to remove fiber optic patch cord. Connect transmit fiber to the rear connector. See Figure 506-2. Connect receive fiber to the front connector. Route fiber out the top of the chassis.

    Reference: DLP-507 Fiber Optic Connector and Adapter Cleaning and Mating Instructions

14. With the module still withdrawn, adjust the fibers as required to remove any excess slack. Hold the fibers with one hand to guide them while the module is being fully inserted into the chassis.

15. Slide the ODS2 module slowly into the chassis. Route the fibers through the Fiber Management Baffle without exceeding the minimum bend radius.

16. Using the ODS2 module ejector, press the module into the chassis until it is properly seated. If there is excessive resistance, withdraw the module and check for alignment or obstructions.

17. Did the STATUS indicator light green? If there is no DS2 signal present, the OPT FAIL indicator will be lighted red.
    - If **Yes**, continue to Step 18.
    - If **No**, replace ODS2 module and go to Step 4.

18. Will this system be configured as DS2 Protected?
    - If **Yes**, continue to Step 19.
    - If **No**, go to Step 23.

19. Remove an ODS2 module from the protective packaging and inspect for damage.

20. Install protect ODS2 module in the slot adjacent to the working module.

    Reference: DLP-523 Assignment Records

21. Align protect module with the slots and slide module into the chassis until the two fiber connectors protrude about three inches out from the front of the chassis. Do not seat module in connector at this time.

22. Repeat Steps 5 through 17 for the protection ODS2 module, then go to Step 23.

23. Repeat the entire procedure for each ODS2 module to be installed.

Stop! You have completed this procedure.

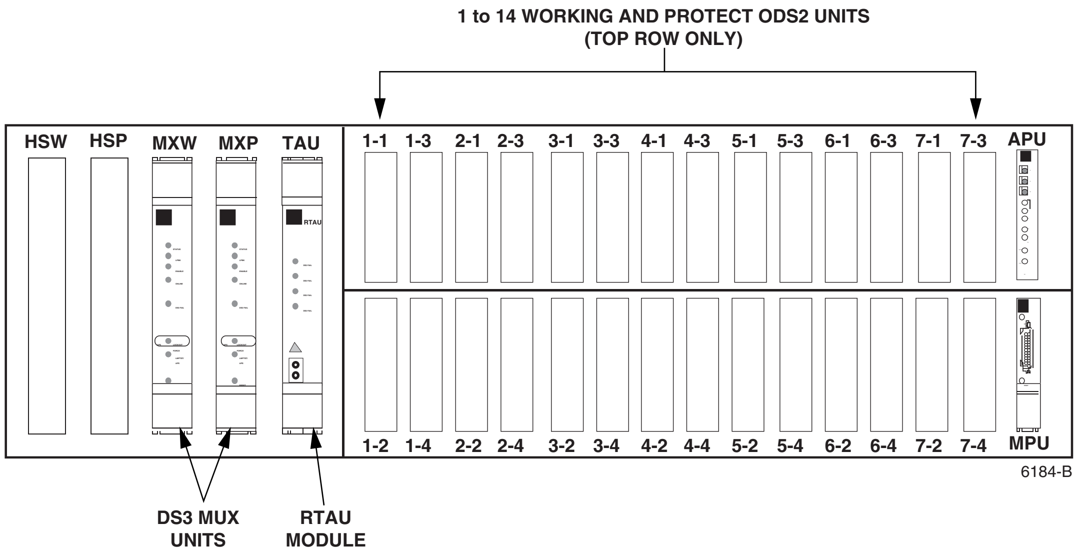

Figure 506-1. ODS2 Module Locations

Table 506-1. DS2 Signal Routing

DS2 SIGNAL	DS1 SIGNALS	GROUP-SLOT NUMBER WORKING UNIT	GROUP-SLOT NUMBER PROTECT UNIT
1	1 to 4	1-1	1-3
2	5 to 8	2-1	2-3
3	9 to 12	3-1	3-3
4	13 to 16	4-1	4-3
5	17 to 20	5-1	5-3
6	21 to 24	6-1	6-3
7	25 to 28	7-1	7-3

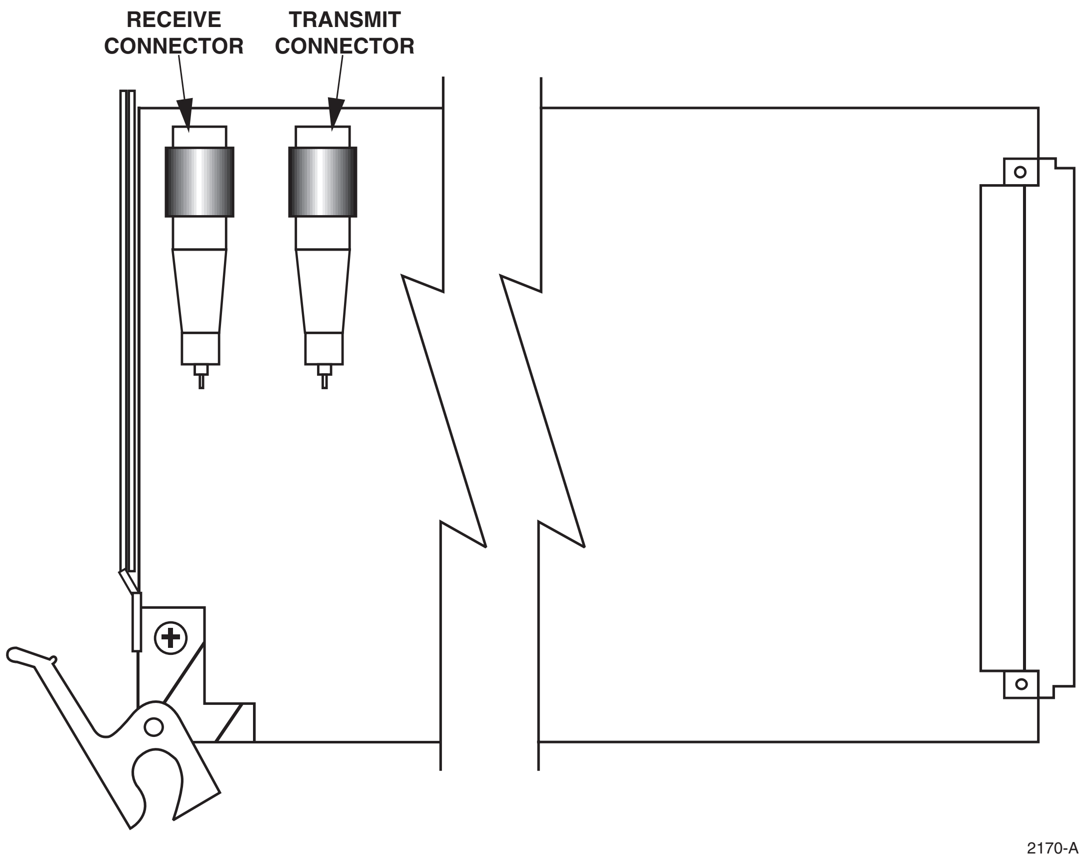

Figure 506-2. ODS2 Transmit and Receive Connector Locations

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FIBER OPTIC CONNECTOR AND ADAPTER CLEANING AND MATING INSTRUCTIONS

Summary: The performance of an optical fiber system is largely dependent on the fiber connector cleaning procedures performed before installation. This procedure provides instructions for cleaning and mating optical fibers.

1. Assemble the following required cleaning materials, as shown in Figure 507-1:
   - Lint-free laboratory wipes
   - Cotton tipped swabs
   - Isopropyl alcohol in a pressurized dispenser
   - Lint-free pipe cleaners
   - Clean, dry, oil-free compressed air

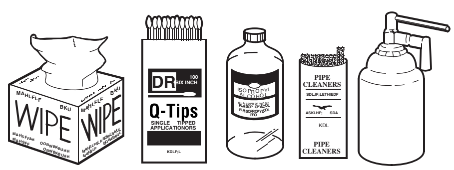

Figure 507-1. Cleaning Materials

2. Clean connectors by moistening a lint-free wipe with alcohol, then wipe completely around the connector ferrule twice and several times across the tip.

3. Use a lint-free dry wipe to wipe completely around the connector ferrule twice. Also wipe several times across the tip.

4. Blow across the end of the ferrule with clean, dry, compressed air.

5. Visually inspect the connector tip for cleanliness. If the tip does not appear to be thoroughly cleaned, repeat Steps 2, 3, and 4.

6. SC and FC adapters are cleaned by using a pipe cleaner moistened with alcohol. Insert the pipe cleaner into either end of the adapter and rotate so the inside surface of the adapter is wiped by the pipe cleaner. Repeat this procedure for the opposite end. Blow the adapter dry with clean compressed air.

7. Clean attenuators with clean, dry compressed air only. Do not use a moistened wipe or pipe cleaner.

8. Mate the SC and FC connectors by inserting the connector into the adapter and aligning the connector key with the adapter key slot.

9. On FC connectors, push the connector into the adapter and screw the threaded cap clockwise onto the adapter to complete the connection.

10. Connect SC connector by aligning the housing key with the slot in the adapter. Push the connector into the adapter until a click is heard/felt indicating that the latching system is engaged. When connector is fully engaged, the white stripes on the sides of the connector housing should be hidden inside the adapter.

Stop! You have completed this procedure.

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–48 VDC POWER SUPPLY TEST

Summary: This procedure provides instructions for testing the voltage at the power terminal block located on the Soneplex Broadband chassis backplane. The multimeter should indicate between –42.5 VDC and –56.5 VDC.

1. Obtain a multimeter capable of measuring 40 to 60 volts DC.
2. Are fuses installed at the fuse and alarm panel?
   - If **No**, continue to Step 3.
   - If **Yes**, continue to Step 4.
3. Install –48 VDC fuses in both A and B fuse holders.
4. Are any of the fuses open or blown?
   - If **No**, continue to Step 8.
   - If **Yes**, continue to Step 5.
5. Replace blown fuse or fuses.
6. Did fuse blow again?
   - If **Yes**, continue to Step 7.
   - If **No**, continue to Step 8.
7. Clear trouble in the fuse and alarm panel or chassis backplane.
8. Using a multimeter, measure and record the DC voltages. Measure voltage by placing one probe on the positive contact and the other probe on a solid frame ground. Observe DC polarity when taking voltage measurements.
   - Measure the A power feed bus voltage at the fuse holder.
   - Measure the B power feed bus voltage at the fuse holder.
   - Measure the voltage across the –48 A and RTN A terminals on the chassis backplane.
   - Measure the voltage across the –48 B and RTN B terminals on the chassis backplane.
9. Was the voltage measured at all points between –42.5 VDC and –56.5 VDC?
   - If **Yes**, **Stop! You have completed this procedure**.
   - If **No**, continue to Step 10.
10. The problem is in the fuse and alarm panel, the power feed cabling, or at the chassis. Inspect and repair as necessary.

Stop! You have completed this procedure.

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RLX AND RLXIOR STATUS DISPLAY

Summary: This procedure provides instructions for displaying the status of the RLX or RLXIOR modules installed in the selected chassis.

➧ **Note:** The RLXIOR is displayed as “RLX” in the Craft Interface menus and screens.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select Display RLX Status from the Display Status menu. Press Enter or Return. A Display RLX Status screen is shown in Figure 509-1.
2. Move to the Group toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.
3. Move to the Slot toggle field. Select slot number 1, 2, 3, or 4.

   Reference: TAD-106 Access Identifier

Stop! You have completed this procedure.

```
                      RLX STATUS

                Group: 1                  Slot: 1


                Circuit ID:

           DS1 Lpbk Active: NO

              Customer LOS: NO

               Network LOS: NO

             DS1 Line Code: AUTO-NR-B8ZS

          DS1 Frame Format: AUTO-NR-ESF

    DS1 BER Thresh Exceeded: NO



            Press CONTROL-A For Assistance
```

6180-B

Figure 509-1. RLX Status Screen (Typical)

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ODS2 DISTRIBUTION SYSTEM AND QFLC/QLX CHASSIS END-TO-END TESTS

Summary: This procedure provides instructions for performing end-to-end system tests on the equipment in a Soneplex ODS2 distribution system to an QFLC or QLX chassis. Two telephone technicians may be required to perform this test, one at the near end and one at the far end of the system. The installation must be complete and the equipment operating properly. If you are unfamiliar with the Craft Interface system, refer to the Task Index List (IXL-001) found earlier in this manual.

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

1. The following tools and equipment are required to perform this test:
   - Anti-static wrist strap
   - DS3 digital transmission test set with DS1 option
   - DS1 digital transmission test set
   - Patch cords to connect test sets and patch panel
2. At the chassis location, connect a DS3 test set, with DS1 option to the DSX-3 cross-connect or to the DS3 RX and TX connections at the rear of the chassis. See Figure 510-1.
3. Identify the ODS2 working and protect pair corresponding to the DS1 circuit to be tested.
4. Identify the remote QFLC or QLX working and protect pair corresponding to the DS1 circuit to be tested.
5. At the QFLC or QLX location, connect DS1 test set to the DS1 circuit to be tested at the QFLC or QLX DS1 input and output connections, the DS1 patch panel, or at the DSX-1. See Figure 510-1.
6. At both ends of the circuit to be tested, make necessary cross-connects so that both ends of the circuits are connected end-to-end.
7. Using the Craft Interface, verify that the DS3 MUX is EQUIPPED and IN SERVICE.

   Reference: DLP-529 DS3 MUX Configuration
8. Using the Craft Interface, verify that the ODS2 module to be tested is EQUIPPED and is IN SERVICE and the DS1 to be tested is PROVISIONED and IN SERVICE.

   Reference: DLP-530 ODS2 Module Configuration

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9. At the chassis location, insert a test signal into the DS1 to be tested using the DS3 test set with DS1 option.

10. Verify that all alarm indicators on the chassis are off and the DS1 test set at the QFLC or QLX DS1 output is receiving error-free data for the DS1 test signal selected.

11. Repeat Steps 9 and 10 for all DS1 circuits to be tested on the ODS2 module selected.

12. At the QFLC or QLX location, insert a DS1 test signal into the QFLC or QLX DS1 input using the DS1 test set.

13. Verify that all alarm indicators on the chassis are out and the DS3 test set with DS1 option is receiving error-free data in the DS1 selected for test.

14. Repeat Steps 12 and 13 for all DS1 circuits to be tested on the ODS2 module selected.

15. Repeat procedure starting at Step 3 for all ODS2 modules to be tested.

16. Record test results and update office records following local office practices.

Stop! You have completed this procedure.

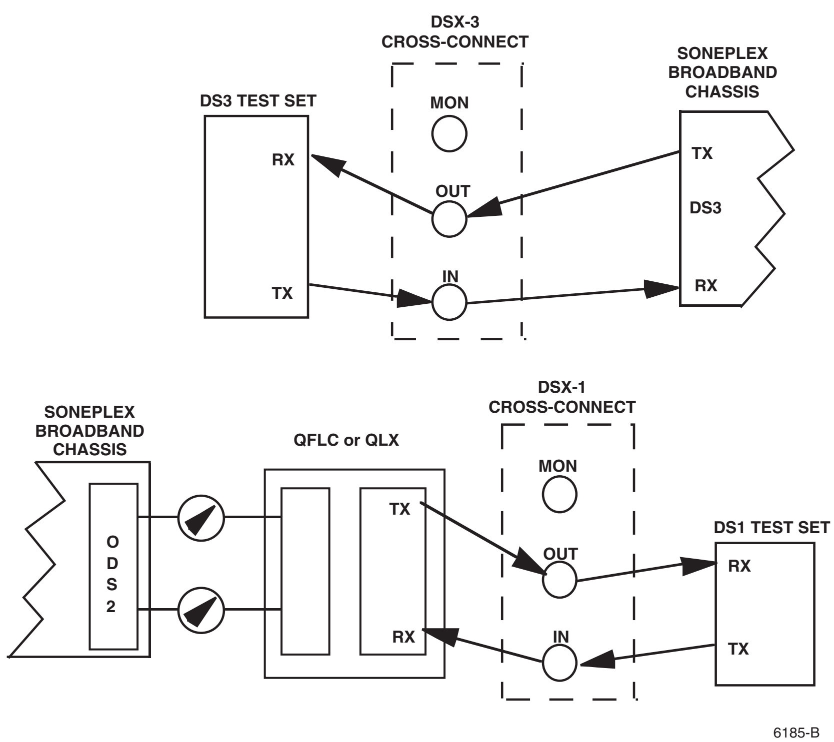

Figure 510-1. Test Setup

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DS3 MUX FORCED SWITCH TEST

Summary: This procedure provides instructions for testing the forced-switch capability of the DS3 MUX in the Soneplex Broadband system. An end-to-end data path test is also performed using only the working DS3 MUX. The forced-switch occurs first to bring the Protect DS3 MUX online, then the end-to-end data path test is repeated.

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

1. Identify the offline DS3 MUX; its STATUS indicator is green and its ONLINE indicator is extinguished.
2. Hold ENABLED button down and momentarily press LMPTST/APS on offline DS3 MUX.
3. Verify that the DS3 MUX that was offline is now online (its ONLINE indicator is now green) and DS3 MUX that was online is now offline (its ONLINE indicator is extinguished).
4. Verify that APS indicator on online DS3 MUX is yellow indicating a forced switch and APS disabled.
5. Repeat Step 2 and verify that APS indicator is off.
6. Perform end-to-end test and verify error-free data.
7. Set up the chassis and perform end-to-end tests between chassis and remote unit.

   Reference: DLP-510 ODS2 Distribution System and QFLC/QLX ChassisEnd-to-End Tests

   Reference: DLP-520 HLXC and HLXR End-to-End Tests

   Reference: DLP-522 DLX- or RLX-Equipped Circuit End-to-End Tests

Stop! You have completed this procedure.

DS3 MUX APS TEST

Summary: This procedure provides instructions for verifying that the APS (Automatic Protection Switching) feature of the DS3 MUX module is working. Both working (online) and protect (offline) DS3 MUX modules are tested.

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

1. Identify the offline DS3 MUX. Its STATUS indicator is green and its ONLINE indicator is extinguished.

2. Slide the offline DS3 MUX part way out. This disconnects the DS3 MUX from the Soneplex Broadband system and ensures that data passes through the online DS3 MUX only.

3. Perform end-to-end test and verify error-free data.

4. Set up the Soneplex Broadband system and to perform end-to-end tests between chassis and remote unit.

Reference: DLP-510	ODS2 Distribution System and QFLC/QLX Chassis End-to-End Tests
Reference: DLP-520	HLXC and HLXR End-to-End Tests
Reference: DLP-522	DLX- or RLX-Equipped Circuit End-to-End Tests

5. Using the DS3 MUX ejectors, press the module into the chassis until it is properly seated.

6. Verify that the STATUS indicator on the offline DS3 MUX is green and the ONLINE indicator is extinguished.

7. Verify that the STATUS indicator on the online DS3 MUX is green and the ONLINE indicator is green.

8. If the online DS3 MUX APS LOCKOUT/FORCE indicator is on, hold the ENABLED button down and momentarily press LMPTST/APS to extinguish the APS indicator.

9. Slide the online DS3 MUX partly out to cause an APS.

10. Verify that the DS3 MUX that was offline is now online (its ONLINE indicator is green).

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11. Perform the end-to-end test and verify error-free data.

    Reference: DLP-510 ODS2 Distribution System and QFLC/QLX Chassis End-to-End Tests

    Reference: DLP-520 HLXC and HLXR End-to-End Tests

    Reference: DLP-522 DLX- or RLX-Equipped Circuit End-to-End Tests

12. Insert partially removed DS3 MUX back into the chassis until it is properly seated.

13. Verify that STATUS indicator on offline DS3 MUX is green and its ONLINE indicator is extinguished.

Stop! You have completed this procedure.

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ODS2 MODULE FORCED SWITCH TEST THROUGH THE CRAFT INTERFACE

Summary: This procedure provides instructions for verifying that the force-to-protect feature of the ODS2 module is working. Both working (online) and protect (offline) ODS2 modules are tested.

⚠ **Warning:** *Do not insert module edge connectors into the chassis connectors before connecting the optical fiber to the module. Exposure to invisible laser radiation may occur if the module edge connectors are allowed to connect with the chassis connectors before connecting the optical fiber to the module. Verify that all indicators are dark (off) and the module is not engaged with the chassis connectors before proceeding.*

⚠ **Warning:** *Verify that module is completely disconnected from the chassis connectors before removing the optical fiber from the module. Verify that the far end transmitter is off before proceeding. Exposure to invisible laser radiation from the optical fiber is possible if the far end transmitter is transmitting. Verify that all indicators are dark (off).*

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

1. Set up the chassis and a remote QFLC or QLX chassis, then perform end-to-end tests between chassis and the remote chassis.

   Reference: DLP-510 ODS2 Distribution System and QFLC/QLX Chassis End-to-End Tests

2. Identify the offline ODS2 module of the working and protect pair to be tested. Its STATUS indicator is green and is the only illuminated indicator (its ONLINE indicator is extinguished).

3. Slide the offline ODS2 module part way out; this disconnects the offline module from the chassis and ensures that data passes through the online ODS2 module only.

4. Perform end-to-end test and verify error-free data.

   Reference: DLP-510 ODS2 Distribution System and QFLC/QLX Chassis End-to-End Tests

5. Using the ODS2 module ejector, press the module into the chassis until it is properly seated.

6. Verify that the STATUS indicator on offline ODS2 module is green and its ONLINE indicator is extinguished.

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7. Hold ENABLED button down and momentarily press LMPTST/APS on the offline ODS2 module.

8. Verify that the ODS2 module that was offline is now online (its ONLINE indicator is green) and ODS2 module that was online is now offline (its ONLINE indicator is extinguished).

9. Verify that the APS indicator on the online ODS2 module is red indicating a forced switch and APS disabled.

10. Slide the offline ODS2 module part way out of the chassis; this disconnects the offline module from the chassis and ensures that data passes through the online ODS2 module only.

11. Perform end-to-end test and verify error-free data.

    Reference: DLP-510 ODS2 Distribution System and QFLC/QLX Chassis End-to-End Tests

12. Using the ejector, press the offline ODS2 module into the chassis until it is properly seated.

13. Verify that STATUS indicator on offline ODS2 module is green and ONLINE indicator is extinguished.

Stop! You have completed this procedure.

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ODS2 MODULE APS TEST

Summary: This procedure provides instructions for verifying that the APS (Automatic Protection Switching) feature of the ODS2 module is working. Both working (online) and protect (offline) ODS2 modules are tested.

Warning: *Verify that module is completely disconnected from the chassis connectors before removing the optical fiber from the module. Verify that the far end transmitter is off before proceeding. Exposure to invisible laser radiation from the optical fiber is possible if the far end transmitter is transmitting. Verify that all indicators are dark (off).*

Warning: *Do not insert module edge connectors into the chassis connectors before connecting the optical fiber to the module. Exposure to invisible laser radiation may occur if the module edge connectors are allowed to connect with the chassis connectors before connecting the optical fiber to the module. Verify that all indicators are dark (off) and the module is not engaged with the chassis connectors before proceeding.*

Caution: *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

1. Set up the Soneplex Broadband system and QFLC or QLX to perform end-to-end tests.

   Reference: DLP-510 ODS2 Distribution System and QFLC/QLX Chassis End-to-End Tests

2. Identify the offline ODS2 module of the working and protect pair to be tested. The STATUS indicator is green and is the only illuminated indicator (its ONLINE indicator is extinguished).

3. Slide offline ODS2 part way out. This disconnects the ODS2 from the chassis and ensures that data passes through the online ODS2 only.

4. Perform end-to-end test and verify error-free data.

   Reference: DLP-510 ODS2 Distribution System and QFLC/QLX Chassis End-to-End Tests

5. Using the ODS2 module ejector, press the offline module into the chassis until it is properly seated.

6. Verify that the STATUS indicator on the offline ODS2 module is green, and that its ONLINE indicator is extinguished.

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7. Verify that the STATUS indicator on the online ODS2 module is green, and that its ONLINE indicator is green.

8. If the online ODS2 module APS indicator is red, hold the ENABLED button down and momentarily press LMPTST/APS to extinguish the APS indicator and enable APS.

9. Initiate an Automatic Protection Switch (APS) on the offline ODS2 module using one of the following methods:
   - Slide the online ODS2 module part way out to simulate online board failure.
   - Disconnect fiber cable from the online ODS2 module RX to simulate RX LOS.
   - Slide the online QFLC or QLX partway out to simulate a far-end module failure.
   - Disconnect the fiber cable from the online QFLC or QLX RX to simulate a far-end RX LOS.

10. Verify that ODS2 that was offline is now online (its ONLINE indicator is green).

11. Perform end-to-end test and verify error-free data.

    Reference: DLP-510 ODS2 Distribution System and QFLC/QLX Chassis End-to-End Tests

12. Using the ODS2 module ejector, press the module into the chassis until it is properly seated.

13. Verify that STATUS indicator on offline ODS2 module is green and its ONLINE indicator is extinguished.

14. Repeat Steps 8 through 13 for each APS simulation given in Step 9.

Stop! You have completed this procedure.

HDSL-EQUIPPED CIRCUIT CROSS-CONNECTS

Summary: This procedure provides instructions for making any necessary cross-connects on HDSL loops, and then re-install the HLXC modules.

⚠ **Danger:** *To avoid electric shock, be careful when working near HDSL loop connections or telecommunications circuits. An electrical potential of ±130 volts exists on HDSL loop connections and telecommunications circuits. Coming in contact with this high electrical potential will result in death or severe personal injury.*

⚠ **Caution:** *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

1. Open the chassis cover.
2. Use the ejector at the bottom of each HLXC module front panel to carefully disengage the module from its connector.
3. Withdraw each HLXC module part way to break electrical contact with the backplane connector.

   Note: The HLXC module can be configured to supply –130 VDC simplex current over the HDSL loops to supply power to the remote HLXR modules. When an HDSL Repeater (HRX) is in the HDSL loops, HLXC modules can be configured to supply ±130 VDC. Partially withdrawing the HLXC module ensures that current is not present when cross-connects are installed.

4. At the central office, make necessary cross-connects at the Main Distribution Frame, or other facility, in accordance with local practice.
5. At the remote location, make necessary cross-connects at the remote distribution frame, or other facility, in accordance with local practice.
6. Re-install the HLXC module(s) in their mounting slots.

Stop! You have completed this procedure.

HLXC INSTALLATION AND TESTING

Summary: This procedure provides instructions for installing the Version C, D, E, or G HLXC module, which mounts in the half-height slots located in the middle of the chassis. A typical HDSL Loop Extension (HLX) system consists of an HLXC module installed in the chassis and an HLXR module installed at a remote location. There is no protection for the module or signal when using HDSL circuits.

⚠ **Caution:** *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

Note: When using HLXC modules in a group, NEVER install ODS2 modules in any of the unused slots in the group.

1. Select the HLXC module. If it is not already installed, remove the module from its protective ESD packaging. If the HLXC module is installed, remove it and inspect for physical damage.

2. **Version C HLXC only:** locate the configuration switches on the HLXC module printed circuit board as shown in Figure 516-1.

3. **Version C HLXC only:** set the configuration switches as specified in the work order. These switch settings do not need to be set if the unit is to be provisioned via the software. Otherwise, refer to Figure 516-1 for the switch handle settings. The following operating parameters are switch-selectable:

   - Loop 2 (enable/disable)
   - Loop Power (on/off)

   Note: With loop 2 enabled, both HDSL loops will be active allowing a full DS1 payload. With loop 2 disabled, the first 12 DS0 channels will be carried on loop 1 and DS0 channels 13 through 24 will be filled with all ones (fractional DS1).

   Note: When the Loop Power switch is set to the ON position, the HLXC module supplies –130 VDC simplex power to the loops.

4. Determine which HLXC slots are to be used, referring to your work order and Figure 516-2. Chassis slots 1-1 through 7-4 correspond to DS1 signals 1 through 28. See Table 516-1.

   Reference: TAD-106 Access Identifier

5. Align the edges of the printed circuit card with the card guides in the chassis. Use the injector at the bottom of the front panel to press the HLXC module into the chassis. If there is excessive resistance to insertion, remove the module and check for improper alignment or obstructions.

6. Perform the initial start-up test detailed in Figure 516-3, observing the front panel LEDs, and verify that each LED operates as specified. Refer to Figure 516-4 for front panel layouts of the different HLXC versions.

   - If the STATUS LED is green following self-test, proceed to Step 7.
   - If the STATUS indicator is red, the HLXC module has failed self-test diagnostics. Remove and then reinsert the HLXC module and then wait while the HLXC module again performs self-test diagnostics. If the STATUS indicator turns red at the end of the second self-test, the HLXC module is defective. Remove and replace the HLXC, and then repeat Steps 1 through 6.

7. Press the LMPTST switch on the APU to verify that the all the indicators on the HLXC module front panel light yellow. This indicates that each indicator is functional.

   - If each indicator is yellow, continue to Step 8 or 9.
   - If each indicator is not yellow, the HLXC module is defective. Remove and replace the HLXC, and then repeat Steps 1 through 7.

8. Version C HLXC only: if the Loop Power option is selected in Step 3, measure DC voltage and DC current being supplied to the HLXR. (The Version E and Version D HLXC defaults to loop power enabled.)

   Reference: DLP-568 Version C HLXC to HLXR Voltage and Current Test

   Reference: DLP-572 Version D (or Later) HLXC to HLXR Voltage and Current Test

9. Repeat entire procedure for each HLXC module.

Stop! You have completed this procedure.

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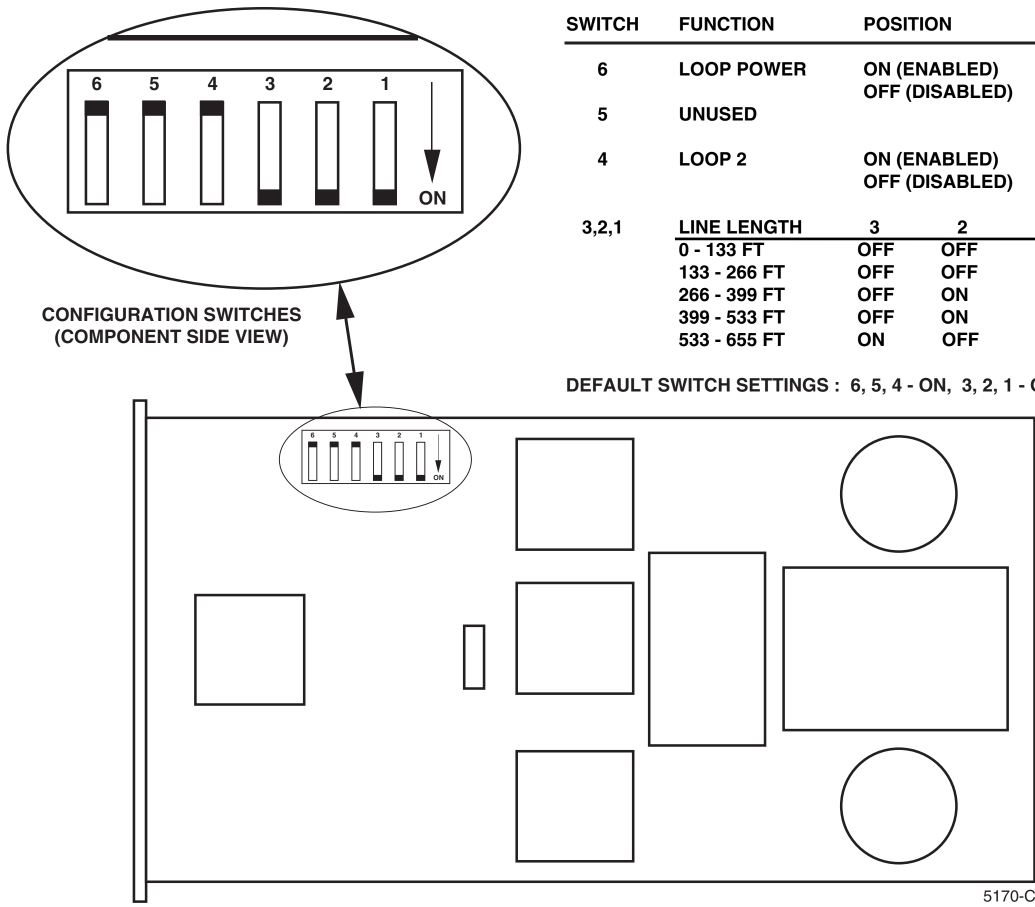


SWITCH	FUNCTION	POSITION		
6	LOOP POWER	ON (ENABLED) OFF (DISABLED)		
5	UNUSED			
4	LOOP 2	ON (ENABLED) OFF (DISABLED)		
3,2,1	LINE LENGTH	3	2	1
	0 - 133 FT	OFF	OFF	OFF
	133 - 266 FT	OFF	OFF	ON
	266 - 399 FT	OFF	ON	OFF
	399 - 533 FT	OFF	ON	ON
	533 - 655 FT	ON	OFF	OFF

DEFAULT SWITCH SETTINGS : 6, 5, 4 - ON, 3, 2, 1 - OFF

Figure 516-1. Version C HLXC Module Configuration Switches

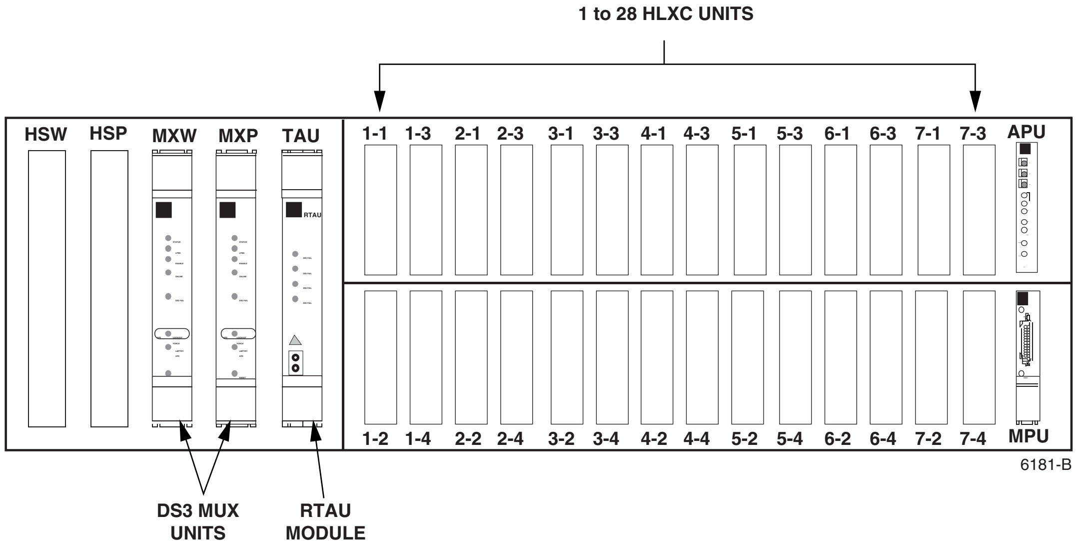


Figure 516-2. HLXC Module Locations

Table 516-1. DS1 Signal Routing

DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER
1	1-1	8	2-4	15	4-3	22	6-2
2	1-2	9	3-1	16	4-4	23	6-3
3	1-3	10	3-2	17	5-1	24	6-4
4	1-4	11	3-3	18	5-2	25	7-1
5	2-1	12	3-4	19	5-3	26	7-2
6	2-2	13	4-1	20	5-4	27	7-3
7	2-3	14	4-2	21	6-1	28	7-4

INITIAL START-UP TEST AND STAND ALONE OPERATION

➧ **Note:** When an HRX is installed, the HLXC indicators only verify the loop segment between the HLXC and the HRX.

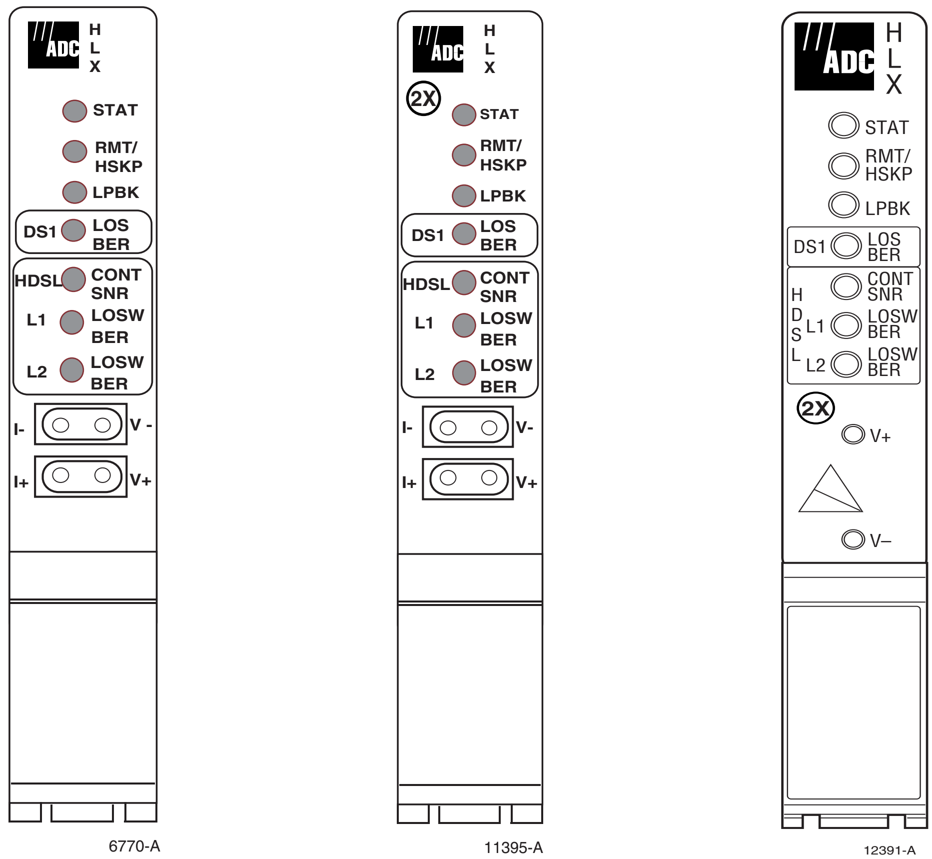
After the HLXC is installed in the chassis, its STATUS indicator will initially turn red to indicate the start of self-test diagnostics. While the self-test is in progress, all indicators will briefly turn yellow. Then all indicators except STATUS will turn off.

Following the successful completion of the self-test, the HLXC front panel indicators will appear as follows:

STATUS	Green to indicate that the self-test was successfully completed.
RMT/HSKP	Off.
LPBK	Off.
DS1 LOS/BER	Red to indicate that a DS1 signal is not being received by the HLXC.
HDSL CONT/SNR	Red (after a short delay) if loop power is enabled which indicate the HDSL loops are open. Off if loop power is disabled.
L1 and L2 LOSW/BER	Red to indicate that the HDSL loops are not synchronized (i.e., HLXR is not in service). If loop 2 is disabled, the L2 indicators will stay off.

6762-C

Figure 516-3. HLXC Module Initial Start-Up



Versions C and D HLXC **Version E HLXC** **Version G HLXC**

Figure 516-4. HLXC Front Panel Layouts

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RTAU INSTALLATION AND TESTING

Summary: This procedure provides instructions for installing the Remote Test Access Unit (RTAU) in the chassis and verifying that it is functioning properly. The RTAU requires no provisioning or periodic maintenance.

Caution: *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. An ESD grounding post is located on the chassis for connecting the ESD wrist band. Ensure that all modules removed from the equipment or not installed, are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

Note: For information about installing and testing the RTAU, which is used with MPU Software Version 5.3, refer to the Soneplex RTAU (Remote Test Access Unit) Installation Instructions manual, listed under Related Publications at the beginning of this manual.

1. Remove the RTAU from its protective packaging.
2. Insert the RTAU into the full height chassis slot labeled TAU (as shown in Figure 517-1) until it reaches the backplane connector.
3. Using the ejectors, fully seat the RTAU in the chassis. A moderate amount of force may be required to properly seat the module in the backplane connector.
4. Did the STATUS indicator light green?
   - If Yes, you have completed this procedure.
   - If No, replace the RTAU and return to Step 1.

Stop! You have completed this procedure.

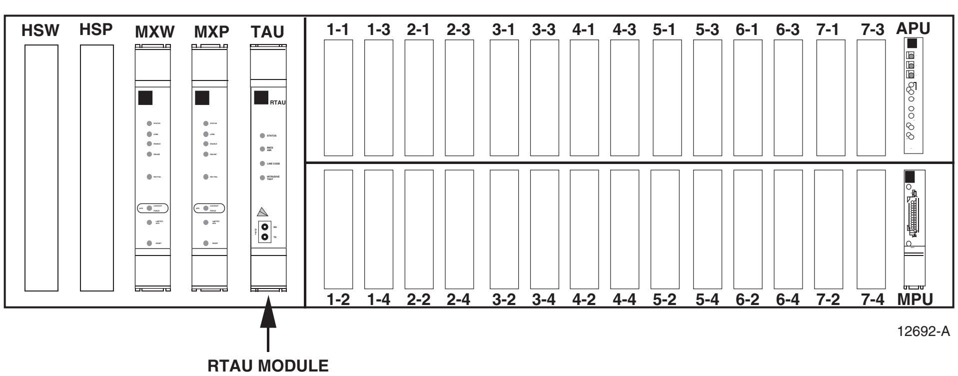

Figure 517-1. RTAU Mounting Position in the Soneplex Broadband Chassis

RLX ALARM LEVEL SETTING

Summary: This procedure provides instructions for assigning RLX alarm levels to each field.

➧ **Note:** A “toggle” field type means the user can press the space bar to view and select the next option that is described; or the user can press the “R” key to view and select the previous option. An “input” field type means the user must type an entry in the field according to the parameters described. A “fixed” field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be made in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be saved in one of two ways: 1) Press an arrow key and then Enter or Return once; or 2) Press Enter or Return twice after all selections and entries are made in the screen but before leaving the screen. The message, “Configuration Successful…Press Any Key To Continue," appears on the screen if the entries have been accepted.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Set Alarm Levels from the Alarms menu. Press Enter or Return.

3. Select Set RLX Alarm Levels from the Alarm Levels menu. Press Enter or Return. An RLX Alarm Levels screen with default values is shown in Figure 518-1.

4. Move to the Group toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

5. Move to the Slot toggle field. Select slot number 1, 2, 3, or 4.

   Reference: TAD-106 Access Identifier

6. Move to the Equipment Alarms toggle fields. Select CRITICAL (CR), MAJOR (MJ), MINOR (MN), EVENT (EV) or NOT RPTD (not reported) for each field that you wish to change.

➧ **Note:** Abbreviations of the alarm field options (except NOT RPTD) will appear in the Active Alarms and Alarm History screens. In addition, what options you select at any alarm level setting screen will determine whether you will be notified of the alarm.

Reference: DLP-552 Alarm/Event Notification Level Setting

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7. Move to the DS1 Facility Alarms toggle fields. Select CRITICAL, MAJOR, MINOR, EVENT, or NOT RPTD for each field that you wish to change.

   Reference: TAP-101 Alarm Troubleshooting

8. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

```
             RLX ALARM LEVELS

           Group: 1    Slot: 1

            Equipment Alarms
            ===================
            COMM FAIL        : MAJOR

            DS1 Facility Alarms
            ===================
            AIS              : EVENT
            LOF              : MAJOR
            LOS              : MAJOR
            T-BERL           : MINOR
            YELLOW           : EVENT
            CUSTOMER LOOPBACK: MINOR
            NETWORK LOOPBACK : MINOR

      Press CONTROL-A For Assistance
```

6118-D

Figure 518-1. RLX Alarm Levels Screen (with Default Values)

MPU REPLACEMENT AND TESTING

Summary

This procedure provides instructions for installing a previously configured MPU in a chassis (whether provisioned or not) and verifying that the MPU is functioning. When an MPU from a provisioned chassis is moved to another chassis, the chassis unit (module) configurations may not match the MPU unit configurations. These instructions explain how to avoid unwanted data replacements or data conflicts. The MPU contains both general configuration data and unit configuration data.

All configuration data can be restored to the MPU by performing a database upload or download procedure. The upload is outlined in DLP-554 (Configuration Data Upload Command), and the download is outlined in DLP-555 (Configuration Data Download Command).

General Configuration Data

System administration and maintenance tasks create general configuration data (alarm levels, PM thresholds, system identification, port configuration, and user account data).

Unit Configuration Data

Individual module configurations create unit configuration data (which includes unit service state, framing, line coding, etc.) Unit configuration data does not need to be re-entered as long as the chassis remains powered and transmission units remain installed. Unit configuration data is also stored in the transmission units and is loaded back into a non-configured MPU automatically.

➧ **Note:** When installing a replacement MPU module, use the same DIP or rotary switch settings on the MPU's printed circuit board as the MPU you are removing.

➧ **Note:** When an MPU is removed from a powered-up chassis, the MPU retains both general and unit configuration data for at least 24 hours. Do not install a still-configured MPU in an already-configured chassis. If you want to retain unit configuration data in all transmission units (or prevent alarms) and you are installing a previously configured MPU, verify that the MPU's unit configuration data is gone before you re-install it.

⚠ **Caution:** *Do NOT re-install MPUs with revisions older than 3.1, or MPUs that have an older revision than the currently installed MPU. A corrupted database may result.*

⚠ **Caution:** *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

1. To save the replacement MPU's current configuration data, upload configuration data to the host computer. Contact the Technical Assistance Center at ADC Telecommunications, described in the General Information section of this manual, for more information.

   Reference: DLP-554 Configuration Data Upload Command

2. Locate the mounting slot designated for the MPU as shown in Figure 519-1.

3. Align the edges of the module printed circuit card with the guides in the chassis slot. Use the injector at the bottom of the front panel to press the MPU into the chassis. If there is excessive resistance to insertion, remove the module and check for improper alignment and obstructions.

   Note: If you are not sure that the MPU's database is cleared, contact the ADC Technical Assistance Center at 1-800-366-3891, ext. 3223, or 1-612-946-3223 for more information.

4. Use the screw provided to secure the MPU to the top edge of the chassis.

5. Observe the STATUS LED as shown in Figure 519-2. Initially, the status LED will be yellow while the MPU performs self-test diagnostics. When the self-test diagnostics are successfully completed, the STATUS LED will turn green.

   - If the STATUS LED is green, continue to Step 6.
   - If the STATUS LED is red, the MPU has failed self-test diagnostics. Press the MPU RESET switch and then wait while the MPU again performs self-test diagnostics. If the STATUS LED turns red at the end of the second self-test, the MPU is defective. Remove and replace the MPU, and then repeat Steps 2 through 5.

6. Press the LMPTST switch on the APU to verify that the STATUS LED on the MPU front panel lights yellow. This indicates that the LED is functional. If the STATUS LED does not light yellow, the MPU is defective. Remove and replace the MPU, and then repeat Steps 2 through 5.

7. Connect a VT-100 (or equivalent) control terminal or host computer to the MPU Craft port.

   Reference: DLP-504 Local Craft Interface Connection

8. Turn the power on to the control terminal or host computer and press Enter or Return. The Logon screen appears.

9. Logon to the Craft Interface and check the status of each transmission module to verify that the configuration data is correct.

   Reference: DLP-526 Craft Interface System Logon

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10. Re-enter the MPU configuration data manually or follow this procedure:

    Reference: DLP-555 Configuration Data Download Command

Stop! You have completed this procedure.

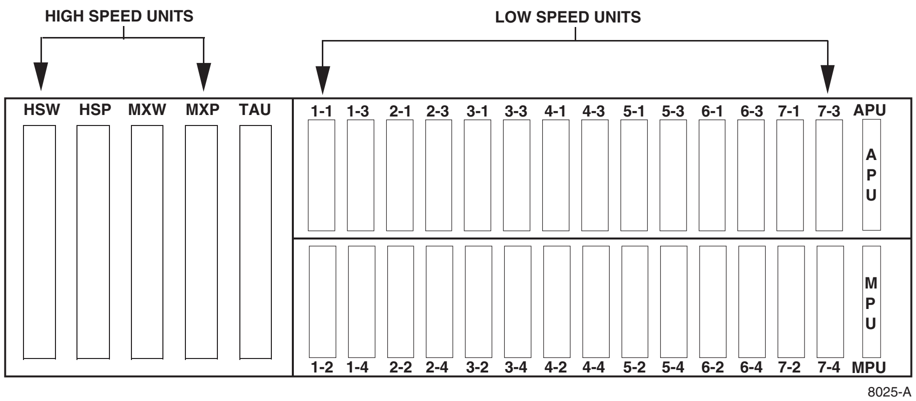

Figure 519-1. Soneplex Broadband Chassis (Front View) Mounting Slot for MPU

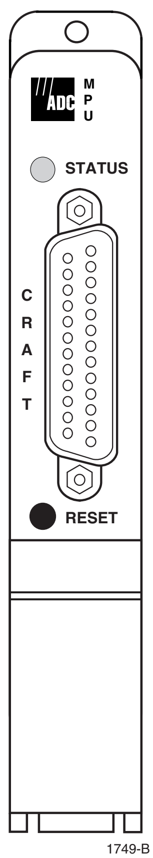

Figure 519-2. MPU Front Panel

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HLXC AND HLXR END-TO-END TESTS

Summary: This procedure provides instructions for using a DS3 test set (with DS1 option) to verify that error-free data is received from the HLXC module at the HLXR module.

Caution: *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

Note: Press CONTROL-A for help information on moving around and editing fields.

1. Connect a DS3 test set (with DS1 option) to the cross-connect or to the RX and TX connections at the rear of the chassis. See Figures 520-1 and 520-2.
2. Identify the HLXC module corresponding to the DS1 circuit to be tested.
3. Identify the HLXR module corresponding to the DS1 circuit to be tested.
4. Connect the DS1 Test Set RX to the NET OUT jack on the front panel of the HLXR module.
5. Connect the DS1 Test Set TX to the NET IN jack on the front panel of the HLXR module.
6. Using the Craft Interface, verify that the DS3 MUX is EQUIPPED and is IN SERVICE.

   Reference: DLP-529 DS3 MUX Configuration
7. Using the Craft Interface, verify that the HLXC module to be tested is EQUIPPED and IN SERVICE and the DS1 to be tested is PROVISIONED and IN SERVICE.

   Reference: DLP-531 HLX Configuration
8. Insert a test signal into the DS1 to be tested using the DS3 test set with DS1 option.
9. Verify that all alarm indicators on the chassis are out and the DS1 test set at the HLXR module NET OUT jack is receiving error-free data for the DS1 test signal selected.
10. Insert a DS1 test signal into the HLXR module NET IN jack using the DS1 test set.
11. Verify that all alarm indicators on the chassis are out and the DS3 test set with DS1 option is receiving error-free data in the DS1 selected for test.
12. Repeat procedure starting at Step 2 for all HLXC modules to be tested.
13. Record test results and update office records following local office practices.

Stop! You have completed this procedure.

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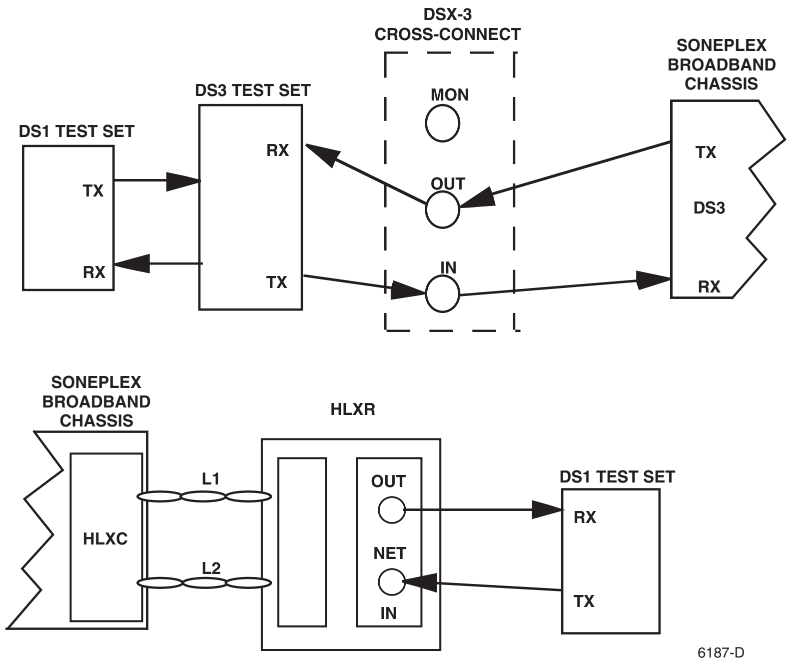

Figure 520-1. Test Set Up (Without HRX)

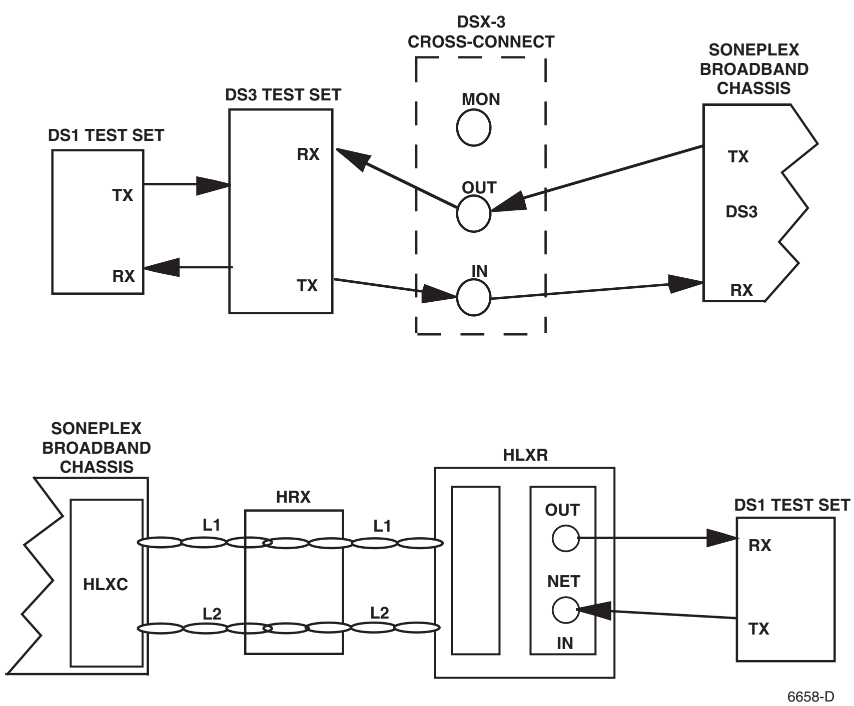

Figure 520-2. Test Set Up (With HRX)

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DLX INSTALLATION AND TESTING

Summary: This procedure provides instructions for mounting DLX modules in the half-height slots located in the middle of the chassis. A typical DLX installation consists of a DLX installed in a chassis and a channel bank at the other end. There is no protection for this signal.

Caution: *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

Note: When using DLX modules in a group, NEVER install ODS2 modules in any of the unused slots in the group.

1. Remove the module from the protective packaging if required. Refer to your work order and determine which DLX slots are to be used. DLX chassis slots are shown in Figure 521-1. Chassis slots 1-1 through 7-4 correspond to DS1 signals 1 through 28 as shown in Table 521-1.

   Reference: TAD-106 Access Identifier

2. Align module with the slots and slide module into the chassis. Using the ejector, press the DLX module into the chassis until it is properly seated.

3. Press LMPTST switch on the APU. Are all indicators lighted?
   - If Yes, continued to Step 4.
   - If No, replace DLX module and go to Step 1.

4. Repeat entire procedure for each DLX module.

Stop! You have completed this procedure.

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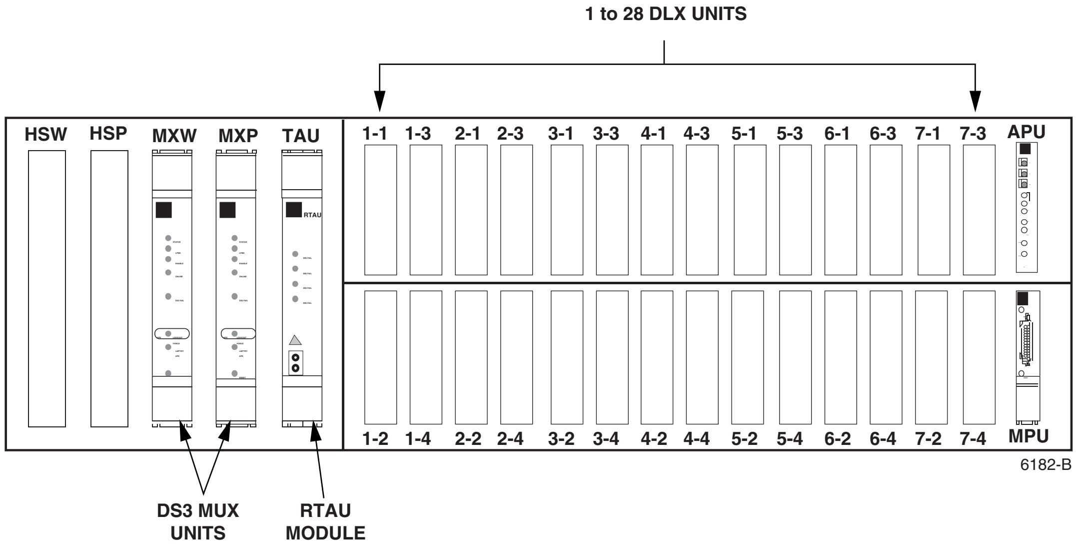

Figure 521-1. DLX Module Locations

Table 521-1. DS1 Signal Routing

DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER
1	1-1	8	2-4	15	4-3	22	6-2
2	1-2	9	3-1	16	4-4	23	6-3
3	1-3	10	3-2	17	5-1	24	6-4
4	1-4	11	3-3	18	5-2	25	7-1
5	2-1	12	3-4	19	5-3	26	7-2
6	2-2	13	4-1	20	5-4	27	7-3
7	2-3	14	4-2	21	6-1	28	7-4

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DLX- OR RLX-EQUIPPED CIRCUIT END-TO-END TESTS

Summary: This procedure provides instructions for performing end-to-end system tests on Soneplex circuits equipped with DLX or RLX plug-ins. Two telephone technicians may be required to perform this test, one at the near end and one at the far end of the system. The installation must be complete and the equipment operating properly before performing this test.

⚠ **Warning:** *To prevent electric shock and/or equipment damage, disable span power at the RLX module before performing this test.*

1. At the chassis, identify the DLX or RLX pair that corresponds to the DS1 circuit to be tested.

   Reference: DLP-532 DLX Configuration

   Reference: DLP-533 RLXIOR Configuration

   Reference: DLP-534 RLX Configuration

2. At the chassis, connect a DS3 test set with DS1 option to the DSX-3 cross-connect or to the RX and TX connections at the rear of the chassis. Adjust the test set for the particular DS1 to be tested. See Figure 522-1.

3. At the far end of the circuit, identify the DS1 pair that corresponds to the circuit to be tested.

4. At the far end of the circuit, connect a DS1 test set to the circuit to be tested at the DS1 input and output connections, the DS1 patch panel, or at the DSX-1 module. Adjust the test set for the particular DS1 to be tested. See Figure 522-1.

5. At both ends of the circuit to be tested, make necessary cross-connects so that the circuit(s) is connected end-to-end.

6. Using the Craft Interface, verify that the modules are EQUIPPED and IN SERVICE.

   Reference: DLP-529 DS3 MUX Configuration

   Reference: DLP-532 DLX Configuration

   Reference: DLP-533 RLXIOR Configuration

   Reference: DLP-534 RLX Configuration

7. At the chassis location, insert a test signal into the DS1 to be tested using the DS3 test set with DS1 option.

8. Verify that all alarm indicators on the chassis are off and the DS1 test set at the far end DS1 output is receiving error-free data for the selected DS1 test signal.

9. Repeat Steps 7 and 8 for all DS1 circuits to be tested.

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10. At the far end of the circuit, insert a DS1 test signal into the DS1 input using the DS1 test set.

11. Verify that all alarm indicators on the chassis are off and the DS3 test set with DS1 option is receiving error-free data in the DS1 signal selected for test.

12. Repeat Steps 10 and 11 for all DS1 circuits to be tested.

Stop! You have completed this procedure.

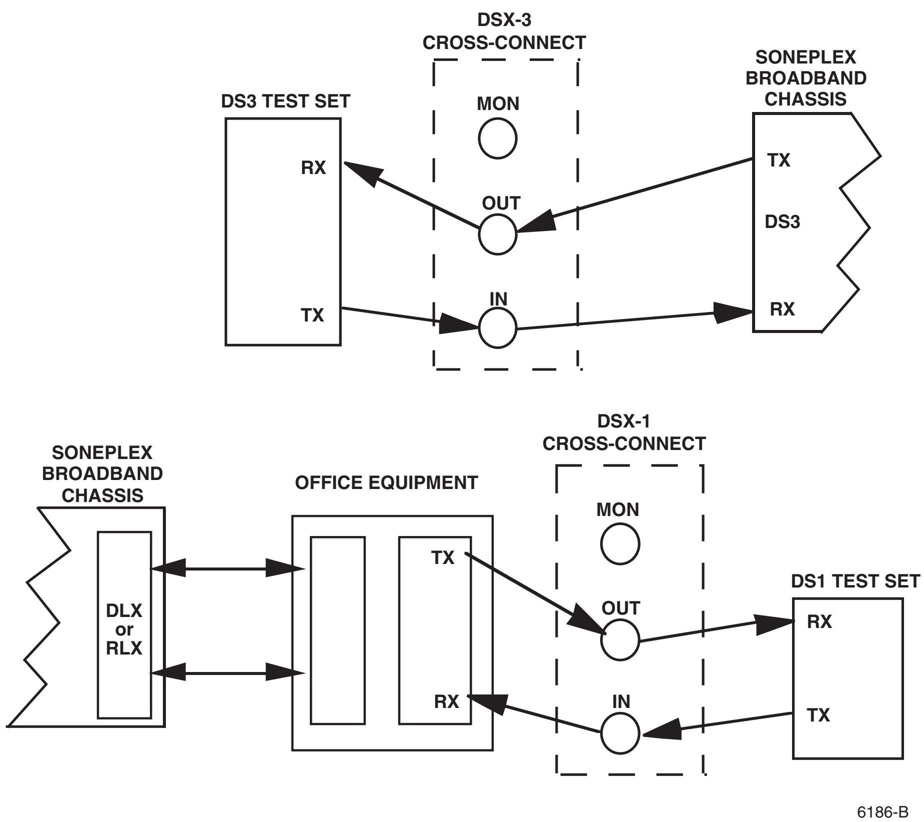

Figure 522-1. Test Setup

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ASSIGNMENT RECORDS

Summary: This procedure provides instructions for recording circuit and facility names, along with the associated group-slot numbers. Each circuit in the Soneplex Broadband system is identified by signal type and location. Signal types are either T1, T2, or T3. Each circuit or system is also assigned a slot number when installed.

1. An example of the circuit line assignment record that may be useful when troubleshooting is shown in Figure 523-1. Chassis slot numbers are shown in Figure 523-2.

2. Record circuit or system name and the associated slot number on your record assignment form.

Stop! You have completed this procedure.

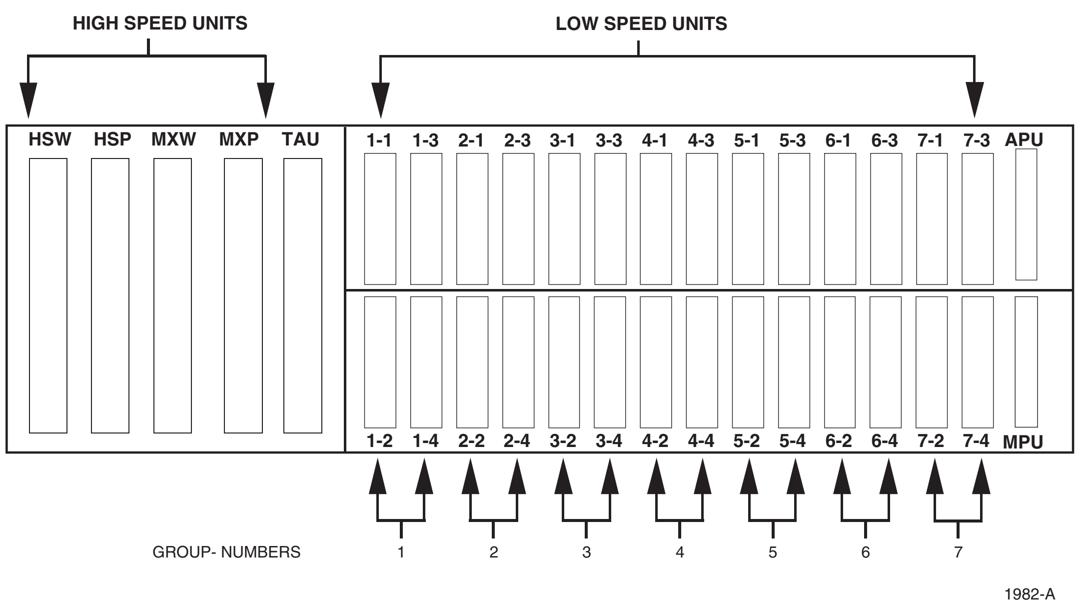

Figure 523-1. Slot Numbers

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GROUP-SLOT	SYSTEM (CIRCUIT) NAME
HSW/HSP	
MXW/MXP	
1-1	
1-2	
1-3	
1-4	
2-1	
2-2	
2-3	
2-4	
3-1	
3-2	
3-3	
3-4	
4-1	
4-2	
4-3	
4-4	
5-1	
5-2	
5-3	
5-4	
6-1	
6-2	
6-3	
6-4	
7-1	
7-2	
7-3	
7-4	

Figure 523-2. Assignment Record Form

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RLXIOR INSTALLATION AND TESTING

Summary: This procedure provides instructions for installing the Repeater Loop Extender Intelligent Office Repeater (RLXIOR) module in the chassis. A typical deployment consists of an RLXIOR module installed in a chassis that is connected to a repeater or a series of line repeaters. There is no protection for this signal, and an MPU must be installed to enable configuration and alarm reporting for this module.

The installation procedure consists of unpacking the RLXIOR, setting two configuration switches, installing the RLXIOR in the chassis, and verifying that it is functioning properly. The RLXIOR may be installed in either a Soneplex Broadband chassis or a Soneplex Loop Extender chassis.

Caution: *To enable span power on the RLXIOR module, a proper connection must be made between chassis ground and –48V return at a location in the central office, following local practices. It is recommended that this connection be made outside the Soneplex chassis.*

Caution: *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

1. Open the shipping carton and carefully unpack the RLXIOR from the protective packing material. See Figure 524-1.

2. Set the configuration switches on the RLXIOR to match the requirement of the work order. See Figure 524-2 for the location of switches. The following operating parameters are switch-selectable:

   - Line Power (–130 Vdc or ± 130 Vdc)
   - Channel Blocking Idle Code (7Fhex or FFhex)

   Note: Factory default settings for the RLXIOR switches are –130 Vdc for Line Power and 7Fhex for Channel Blocking Idle Code.

3. Align the edges of the RLXIOR module with the slot guides. Use the ejector to press the module into the backplane connector in one of the module locations, as shown in Figure 524-3. If excessive resistance is encountered, remove the module and check for obstructions or improper alignment.

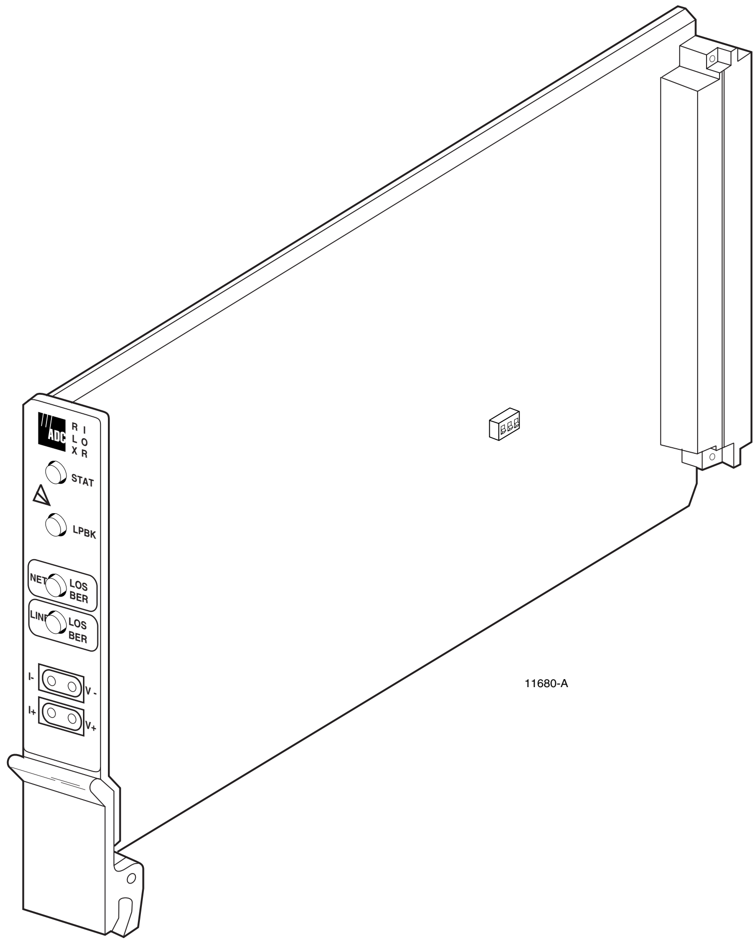

Figure 524-1. Repeater Loop Extender Intelligent Office Repeater (RLXIOR) Module (With Configuration Switches Shown)

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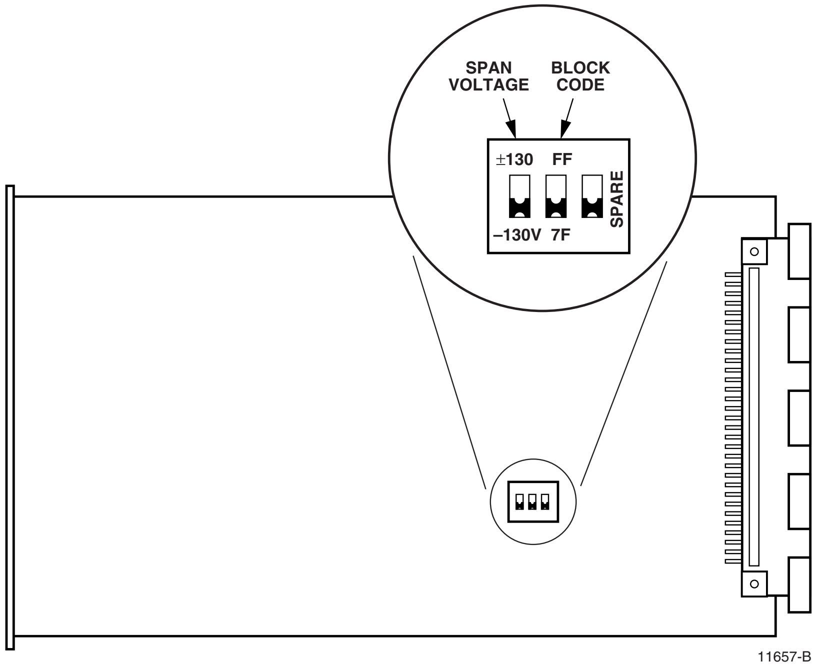

Figure 524-2. RLXIOR Configuration Switches (With Default Settings)

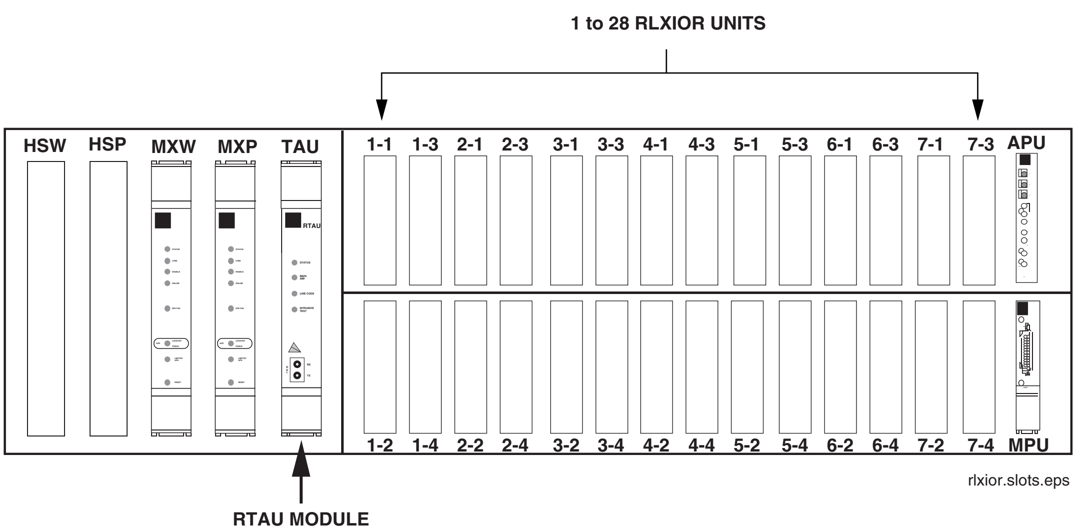

Figure 524-3. RLXIOR Module Locations

4. Observe the front panel LED indicators as shown in Figure 524-4. Following insertion of the RLXIOR module into the chassis (assuming power is available), the STATUS LED turns red indicating the start of self-test diagnostics. All LEDs then turn yellow and remain yellow until self-test diagnostics are completed. Following successful completion of self-test diagnostics, the front panel LEDs appears as follows:

   STATUS — Green, indicates successful completion of self-test diagnostics.

   LPBK — Off

   NET LOS/BER — Off

   LINE LOS/BER — Off

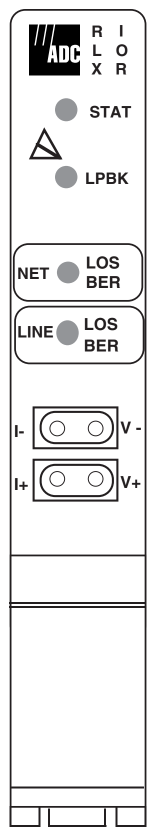

Figure 524-4. RLXIOR Front Panel

5. If the LED indicators respond as described, proceed to Step 6; otherwise, refer to the following to isolate the problem:

   STATUS is red — The RLXIOR module has failed self-test diagnostics. Remove and reinsert the module, then wait while it again performs self-test diagnostics. If the STATUS LED turns red at the end of the second self-test, the module is defective; replace the module, then repeat Steps 1 through 4.

   NET LOS/BER is red — A DS1 signal is not being received from the network.

   NET LOS/BER is yellow — The error rate of the DS1 network signal exceeds the threshold value (default value is 10–7).

   LINE LOS/BER is red — A DS1 signal is not being received from the line.

   LINE LOS/BER is yellow — The error rate of the DS1 line signal exceeds the threshold value (default value is 10–7).

6. Press the LMPTST switch on the APU to verify that all the LEDs on the front panel of the RLXIOR light yellow. This indicates that the LEDs are functional. If all LEDs do not light yellow, the module is defective; replace the module, then repeat Steps 1 through 6.

   Note: The MPU must be installed in the chassis for Step 6 to work.

7. Repeat this entire procedure for each RLXIOR module.

Stop! You have completed this procedure.

RLX INSTALLATION AND TESTING

Summary: This procedure provides instructions for installing Version A RLX or Version B RLX (B1 RLX and B2 RLX+) modules in the chassis and verifying that each unit is functioning. A typical installation consists of an RLX module installed in a chassis that is connected to a repeater or a series of line repeaters. There is no protection for this signal. Version A RLX modules provide an APU interface, and can function without an MPU. There is no APU interface for either Version B RLX module, and an MPU must be installed to enable configuration and alarm reporting for these modules. Other differences between Version A and Version B RLX modules are described below.

Caution: *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. Ensure that all modules removed from the chassis or not installed are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

Note: NEVER install an RLX in the same quad group with ODS2 modules.

1. Locate the configuration switches on the Version A RLX module shown in Figure 525-1, or the jumpers on the Version B RLX module in Figure 525-2 (B1) and Figure 525-3 (B2).

2. Set the configuration switches or jumpers as specified in the work order:

   Version A RLX only: The following operating parameters are switch-selectable:

   - Span (line) Power (On or Off)
   - Transmit Line Buildout (0.0 dB, 7.5 dB, 15.0 dB, or 22.5 dB of attenuation)
   - NID Loop Code Recognition (Enable or Disable)
   - Line Equalization for the DSX (0–133 feet, 133–266 feet, 266–399 feet, 399–533 feet, and 533–655 feet.)

Note: When the Span Power switch is placed in the On (closed) position, the RLX supplies –130 VDC simplex power to the line.

Note: The MPU can override or select the Version A RLX hardware switch settings. These switch settings do not need to be set if the unit provisioning is being performed through the software.

   Reference: DLP-534 RLX Configuration

   Version B RLX only: b1 only The following operating parameters are jumper-selectable:

   - Channel Blocking Idle Code (FFhex or 7Fhex)
   - Line (span) Power (–130 VDC only on the B1 RLX; –130 VDC or ±130 VDC on the B2 RLX+)

➧ **Note:** The Version B RLX switches can be enabled or disabled by the MPU if the jumpers are in place. But the switches' jumper settings themselves (FFhex or 7Fhex for the Channel Blocking Idle switch; –130V or ±130V for the Line Power switch) cannot be overridden by the MPU.

➧ **Note:** The B1 RLX factory default setting for the Channel Blocking Idle Code jumper is 7Fhex; the B1 RLX factory default setting for the Line Power jumper is –130 VDC. The B2 RLX+ factory default setting for the Channel Blocking Idle Code jumper is FFhex; the B2 RLX+ factory default setting for the Line Power jumper is –130 VDC. A missing jumper in the Channel Blocking Idle Code causes a default to FFhex. A missing jumper in Line Power causes a default to no voltage output.

➧ **Note:** If the Line Power jumper is set, it must also be enabled, which is done through software.

Reference: DLP-534 RLX Configuration

3. Refer to your work order to determine which RLX slots are to be used. Slot locations are illustrated in Figure 525-4. Chassis slots 1-1 through 7-4 correspond to DS1 signals 1 through 28 as shown in Table 525-1.

   Reference: TAD-106 Access Identifier

4. Align the RLX module with the slots and slide it into the chassis. Use the ejector to press the RLX module into the backplane connector until it is properly seated. If there is excessive resistance to insertion, remove the unit and check for improper alignment or obstructions.

5. Observe the front panel LED indicators as shown in Figure 525-5 and verify that each LED operates as specified in the initial start-up test.

   - If the STATUS LED is green following self-test, continue to Step 5.
   - If the STATUS LED is red, the RLX has failed self-test diagnostics. Remove and then reinsert the RLX and then wait while the RLX again performs self-test diagnostics. If the STATUS LED turns red at the end of the second self-test, the RLX is defective. Remove and replace the RLX, and then repeat Steps 1 through 5.

6. Press the LMPTST switch on the APU and verify that all indicators light yellow.

   - If Yes, continue to Step 7.
   - If No, replace the RLX module and go to Step 1.

➧ **Note:** An MPU must be present for a Version B RLX lamp test. The MPU does not need to be present for a Version A RLX lamp test.

7. If the Span Power (in the Version A RLX) option or Line Power (in the Version B RLX) option is selected in Step 1, measure DC voltage and DC current being supplied to the repeater.

   Reference: DLP-567 RLX Voltage to Repeater Test

8. Repeat entire procedure for each RLX module.

Stop! You have completed this procedure.

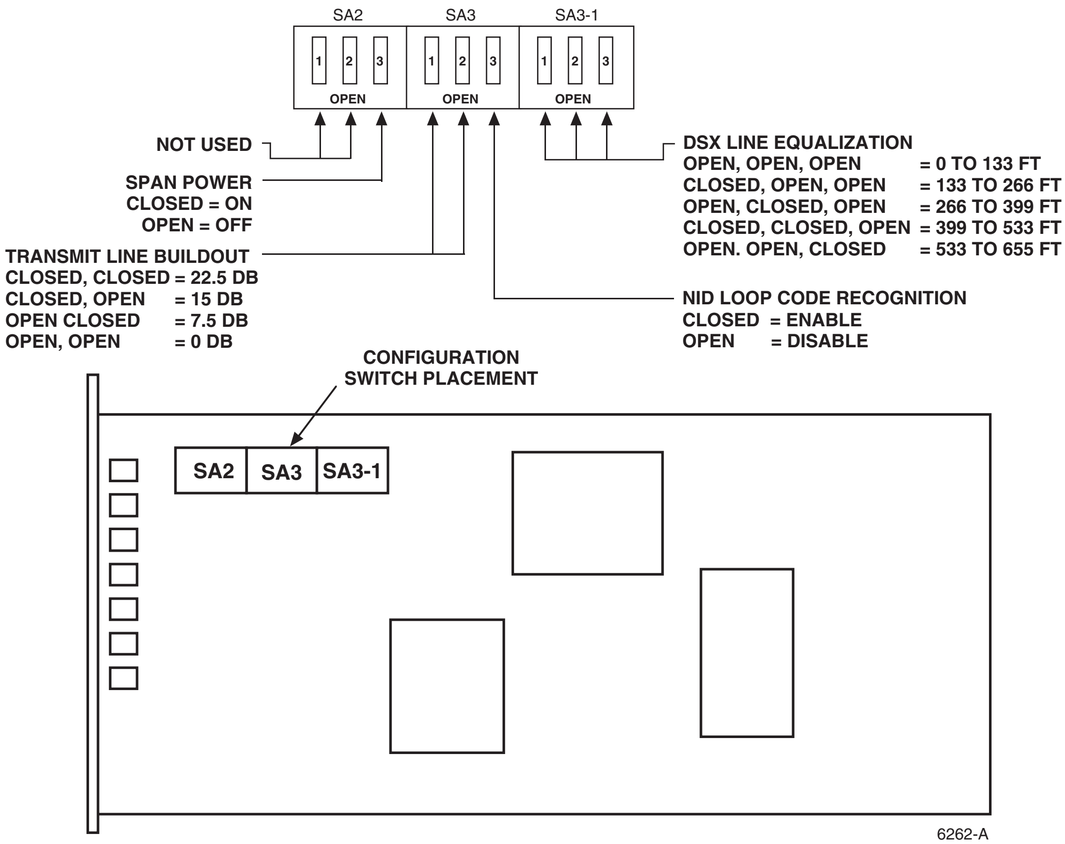

Figure 525-1. Version A RLX Configuration Switches

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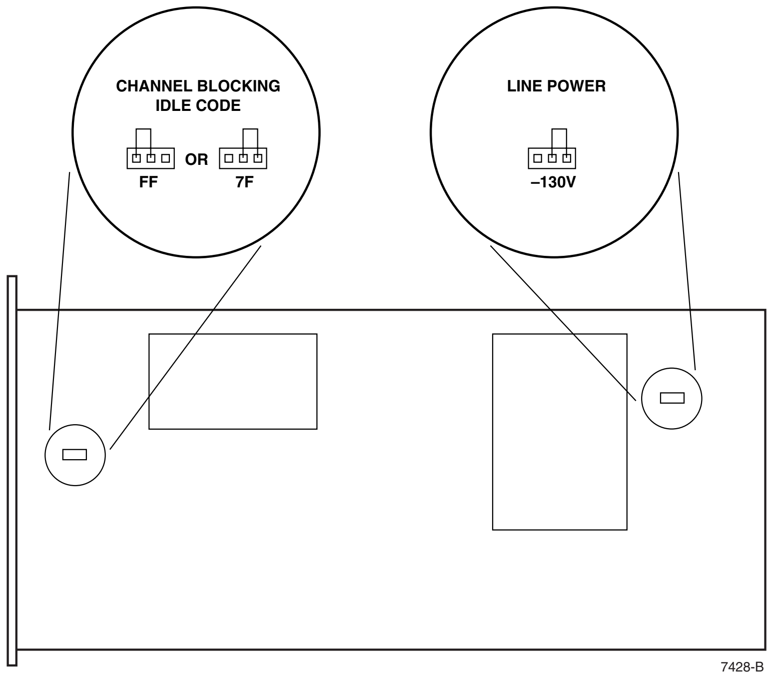

Figure 525-2. Placement of B1 RLX Jumpers

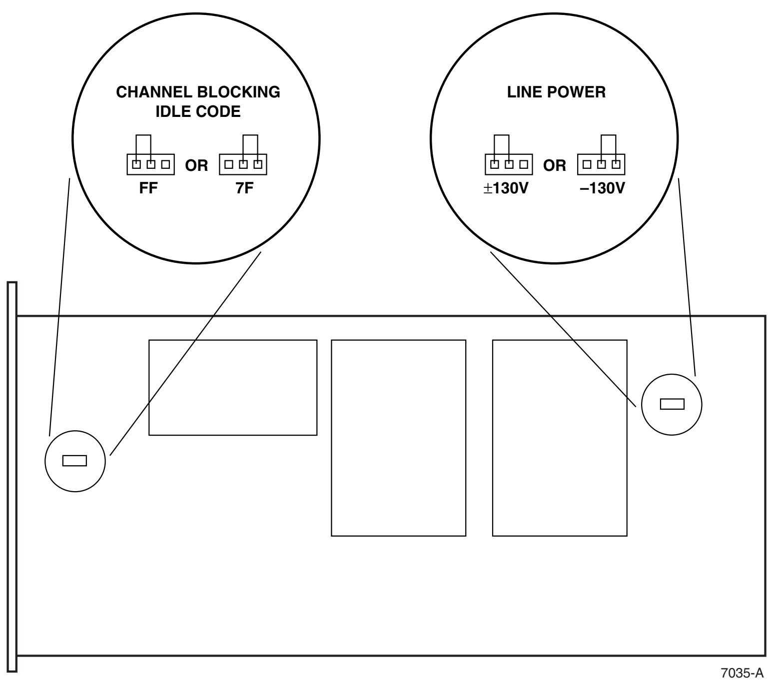

Figure 525-3. Placement of B2 RLX+ Jumpers

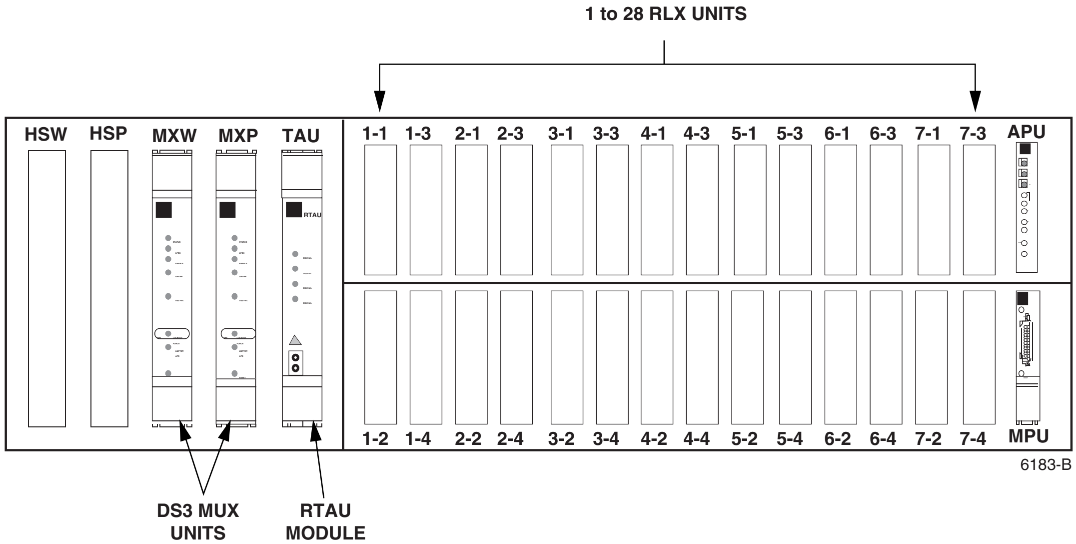

Figure 525-4. RLX Module Locations

Table 525-1. DS1 Signal Routing

DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER
1	1-1	8	2-4	15	4-3	22	6-2
2	1-2	9	3-1	16	4-4	23	6-3
3	1-3	10	3-2	17	5-1	24	6-4
4	1-4	11	3-3	18	5-2	25	7-1
5	2-1	12	3-4	19	5-3	26	7-2
6	2-2	13	4-1	20	5-4	27	7-3
7	2-3	14	4-2	21	6-1	28	7-4

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INITIAL START-UP TEST AND STAND ALONE OPERATION

Following insertion into the mounting shelf, the STATUS LED will initially turn red to indicate the start of self-test diagnostics. While self-test diagnostics are in progress, all LEDs will turn yellow and then remain on until self-test diagnostics are completed.

Following the successful completion of self-test diagnostics, the front panel LEDs will appear as follows:

STATUS - Green to indicate that self-test diagnostics were successfully completed.

LPBK - Off

NET/LOS - Red to indicate that the network DS1 signal is not being received by the RLX.

LINE/LOS - Red to indicate that the line DS1 signal is not being received by the RLX.

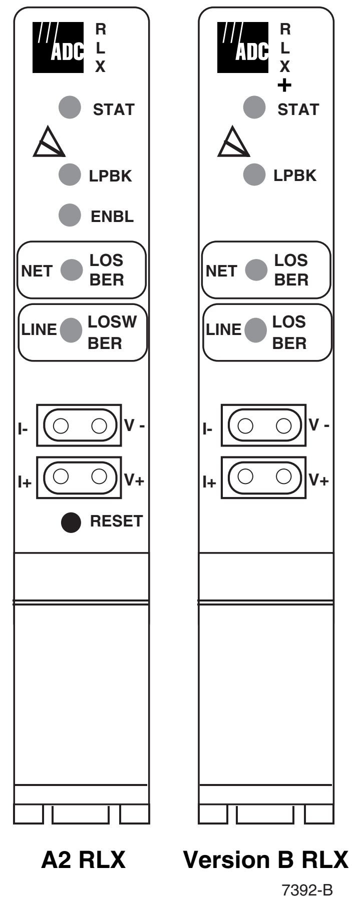

Figure 525-5. RLX Initial Start-Up Test

CRAFT INTERFACE SYSTEM LOGON

Summary: This procedure provides instructions for logon to the Craft Interface system. Logging on consists of connecting the control terminal or host computer to the Soneplex Broadband chassis, entering the communication rate, user name and password, then setting the serial port configuration.

1. Connect chassis to control terminal or host computer.

   Reference: DLP-504 Local Craft Interface Connection

2. Locate power switch on terminal or computer and turn power on. Press Enter or Return. If using a computer, enter the communications software package resident on the computer.

3. At the Enter User Name field on the Logon screen (Figure 526-1), enter assigned User Name. If no User Name is assigned yet, enter SONEPLEX (uppercase only). Press Enter or Return.

4. The Craft Interface requests a password. Enter your assigned password or, if the SONEPLEX user name was used in Step 3, enter SONEPLEX1 (uppercase only). Press Enter or Return.

5. The welcome message and Main Menu (Figure 526-2) should now be displayed on your screen. The welcome message includes the current software version number and a copyright insignia.

6. If this is your initial use of the Craft Interface System, or if you are changing communication device parameter settings, perform the Serial Port Configuration procedure. Otherwise, proceed to Step 7.

   Note: Make the initial Craft Interface connection to the Craft port on the front of the MPU. Initial communication parameter settings for this port are: 9600 baud, no parity, 8 data bits, 1 stop bit.

   Reference: DLP-549 Serial Port Configuration

   Note: Changes to port configurations take effect when you log off and then log back on to the system.

   Reference: DLP-564 Craft Interface System Logoff

7. Use the arrow or number keys to select a sub-menu. After selecting a sub-menu, press Enter or Return to move to the menu you have selected.

   Note: The second line from the bottom of the screen displays any sub-menus available in the selection that is highlighted.

Stop! You have completed this procedure.

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```
Welcome to ADC: SONEPLEX Shelf Interface  Version 5.1.2
    (C) Copyright 1997 ADC Telecommunications, Inc.


          Enter User Name:
```

10454-A

Figure 526-1. Craft Interface Logon Screen

```
Welcome to ADC: SONEPLEX Shelf Interface  Version 5.1.2
   (C) Copyright 1997 ADC Telecommunications, Inc.

                 SONEPLEX MAIN MENU


              1. Alarms
              2. Display Status
              3. Unit Configuration
              4. System Administration
              5. System Configuration
              6. System Maintenance
              7. Performance Monitoring




Display Shelf, MUX, ODS2, QLX, HLX, DLX, RLX Status
           Press CONTROL-A For Assistance
```

6659-D

Figure 526-2. Craft Interface Main Menu

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ALARM HISTORY CLEARANCE COMMAND

Summary: This procedure provides instructions for clearing alarm history and all active alarms for the entire system.

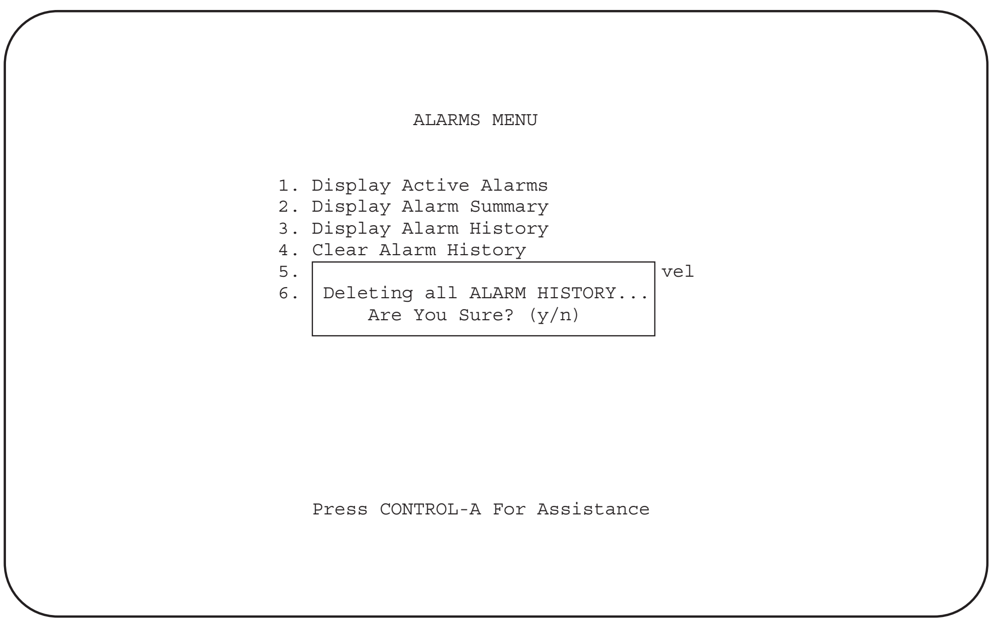
1. Use the arrow keys to select Clear Alarm History from the Alarms menu.

2. At the Clear Alarm History selection prompt, press Enter or Return. The system displays the following message (also shown in Figure 527-1):

   Deleting all ALARM HISTORY. . .
   Are You Sure? (y/n)

3. Clear all alarm history by pressing Y for yes, or cancel clear alarm history by pressing N for no.

Stop! You have completed this procedure.



5314-A

Figure 527-1. Delete Alarm History Query

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SYSTEM TID/DATE/TIME SETTING

Summary: This procedure provides instructions for setting the Craft Interface system internal time and date clock; and entering the Target Identifier (TID). Time and date must be set when the system is first installed or if there is a change in time. Also, each Soneplex Broadband chassis requires a unique identification name or number, called the TID.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful…Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys or number keys to select the System Configuration menu from the Main Menu. Press Enter or Return.

2. Use the arrow keys or number keys to select the System TID/Date/Time screen. Press Enter or Return. The System TID/Date/Time screen should appear. See Figure 528-1.

3. Move the cursor to the TID field and type the TID.

   ➧ **Note:** The TID label can be 1 to 20 characters with no spaces or periods allowed. Only ASCII alpha, numeric, or hyphen characters are allowed. The first character must be an alpha character; middle characters can be alpha, numeric, or hyphens; and the last character must be either alpha or numeric. If a TID of more than 20 characters is entered, all characters after the twentieth are cut off. The TID should be changed only when necessary. The current TID is shown on the System Configuration menu.

4. Use the arrow keys to move the cursor to the Date field. Enter the two-digit number for the month and press the right arrow key. Enter the two-digit number for the date and press the right arrow key. Enter the two-digit number for the year and press the right arrow key.

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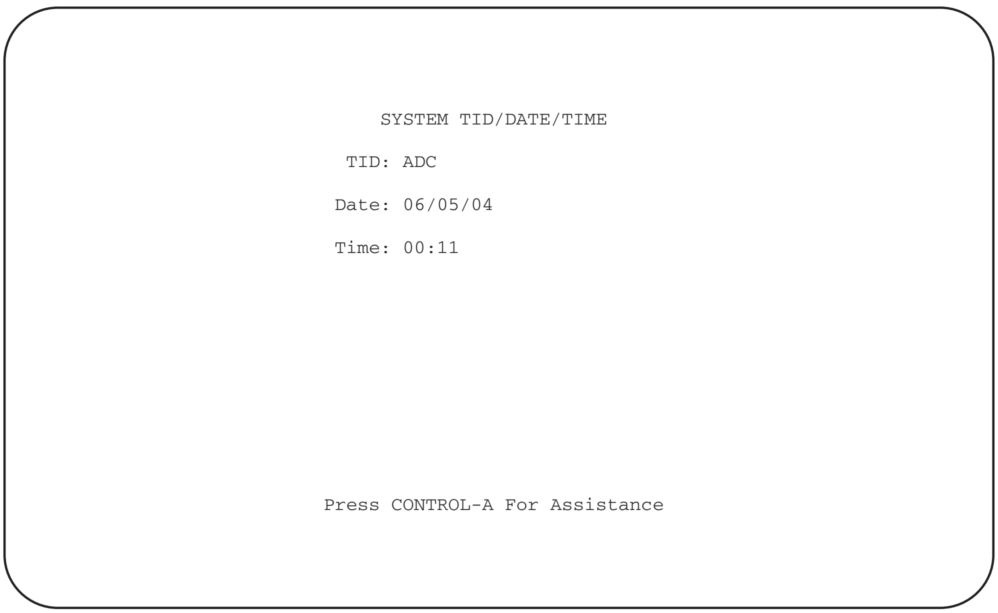
5. Move the cursor to the Time field. Enter 00 to 23 for the hour and press the right arrow key. Enter 00 to 59 for the minutes. The Time field is updated each time the screen is refreshed.

6. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.



6121-B

Figure 528-1. System TID/Date/Time Screen (Typical)

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DS3 MUX CONFIGURATION

Summary: This procedure provides instructions for equipping each DS3 MUX as required, set its service state, and set its protect status.

➧ **Note:** A “toggle” field type means the user can press the space bar to view and select the next option that is described; or the user can press the “R” key to view and select the previous option. An “input” field type means the user must type an entry in the field according to the parameters described. A “fixed” field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits in the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message “Configuration Successful…Press Any Key To Continue” appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. **C1 or D1 DS3 MUX only:** Refer to Table 529-1 for DIP switch settings for the C1 or D1 DS3 MUX, and DS3 CAM (Communications Channel Access Module) channels. Channels 2, 5, 6, and 7 are available on both the DS3 MUX and the DS3 CAM for communication between the central office chassis and the remote control chassis. Although the DS3 MUX and the DS3 CAM both have the same channels, please note that their switch settings are different.

   Refer to Figure 529-1 for a detailed drawing of the switch. When a C1 or D1 DS3 MUX is used with a DS3 Soneplex Remote Control system, the DIP switches on the DS3 MUX board must be set to the correct communications channel. To assure proper operation, the same channel must be selected on the DS3 MUX as well as on the DS3 CAM installed in the remote control chassis. Figure 529-2 shows the location of the switch on the DS3 MUX.

   ➧ **Note:** For more information on the D1 DS3 MUX, refer to the Soneplex D1 DS3 MUX Installation Instructions manual, which is listed under Related Publications at the beginning of this manual.

2. Use the arrow keys to select Unit Configuration from the Main Menu. Press Enter or Return. The Unit Configuration menu appears, as shown in Figure 529-3.

3. Use the arrow keys or number keys to select MUX Configuration from the Unit Configuration menu. Press Enter or Return. A DS3 MUX Configuration screen is shown in Figure 529-4.

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4. Starting at the top of Table 529-2 and working your way to the bottom, configure the DS3 MUX fields.

5. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

Table 529-1. C1 and D1 DS3 MUX and DS3 CAM DIP Switch Settings for DS3 Soneplex Remote Control System

CHANNEL	C1 AND D1 DS3 MUX SWITCH			DS3 CAM SWITCH		
	1	2	3	1	2	3
7	N/A	OPEN	OPEN	OPEN	OPEN	N/A
6	N/A	OPEN	CLOSED	OPEN	CLOSED	N/A
5	N/A	CLOSED	OPEN	CLOSED	OPEN	N/A
2	N/A	CLOSED	CLOSED	CLOSED	CLOSED	N/A

Note: The default setting is channel 7 for both the C1 and D1 DS3 MUX and the DS3 CAM.
Note: The CLOSED/OPEN position indicates that the switch is depressed in that direction.

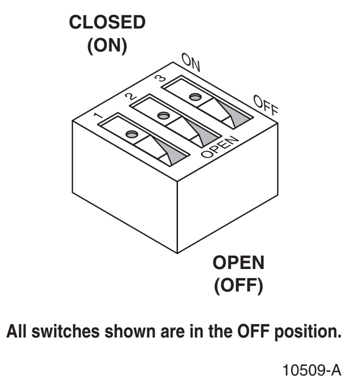

Figure 529-1. C1 and D1 DS3 MUX DIP Switch Detail

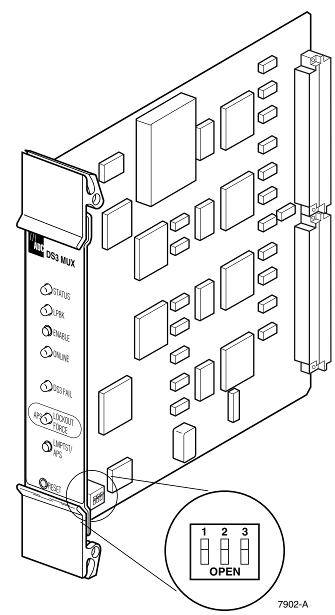

Figure 529-2. C1 and D1 DS3 MUX Channel Selection DIP Switch Location

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```
                    UNIT CONFIGURATION

                 1. MUX Configuration
                 2. ODS2 Configuration
                 3. QLX Configuration
                 4. HLX Configuration
                 5. DLX Configuration
                 6. RLX Configuration





     Display/Edit All MUX Configuration Parameters
             Press CONTROL-A For Assistance
```

8105-B

Figure 529-3. Unit Configuration Menu

```
                    DS3MUX CONFIGURATION


          Unit Equip State      : EQUIPPED
          Unit Service State    : OUT OF SERVICE
          MUX Protect Status    : UNPROTECTED
          Facility Service State: OUT OF SERVICE
          Transmit LBO Setting  : IN
          DS1 Loopback Mode     : C-BIT



       DS3 Framing Format Status (Display Only): M13



             Press CONTROL-A For Assistance
```

6660-C

Figure 529-4. DS3 MUX Configuration Screen

Table 529-2. DS3 MUX Configuration Fields

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Unit Equipment State	Toggle	Equipped	Sets all other fields to default values, establishes communication with the MPU, and allows the MPU to process equipment alarms. Module must be set to EQUIPPED before remaining selections are allowed.	UNEQUIPPED
		UNEQUIPPED	No communication with the MPU.	
Unit Service State	Toggle	IN SERVICE	Places the unit in service and allows equipment alarm reporting by the MPU. Must be set to IS for reporting of equipment alarms.	OUT OF SERVICE
		OUT OF SERVICE	Removes the unit from service and stops equipment alarm reporting by the MPU.	
MUX Protect Status	Toggle	Protected	Designates that equipment APS is available.	UNPROTECTED
		UNPROTECTED	Designates that equipment APS is not available.	
Facility Service State	Toggle	IN SERVICE	Allows facility alarm reporting by the MPU. Must be set to IS for reporting of facility alarms.	OUT OF SERVICE
		OUT OF SERVICE	Stops facility alarm reporting by the MPU.	
Transmit LBO Setting	Toggle	IN	Inserts a Line Build Out (LBO) equivalent to 0 to 224 feet.	IN
		OUT	Inserts a 225 to 450 ft. LBO in the DS3 circuit.	
DS1 Loopback Mode*	Toggle	C-bit	A type of stuff indicator bit based on TR-TSY-000009. A C-bit is used to provide a loopback signal.	C-BIT
		S-bit	A type of stuff indicator bit invented by NEC. An S-bit is used to provide a loopback signal.	
		FEAC	FEAC (Far End Alarm and Control) is a 16-bit code based on GR-499-CORE used to send alarm or status information.	
DS3 Framing Format Status	Display only	M13 or C-bit	This field displays what DS3 path framing format has been detected. Paths with the M13 format have their performance monitored for near-end transmissions; paths with C-Bit Parity format have their performance monitored for both near- and far-end transmissions.	None

* Note: The loopback type configured in this field involves the DS3 MUX only.

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ODS2 MODULE CONFIGURATION

Summary: This procedure provides instructions for establishing initial ODS2 configurations, viewing, and/or editing existing ODS2 configurations for each ODS2 module in the Soneplex Broadband system.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful…Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Unit Configuration from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select ODS2 Configuration from the Unit Configuration menu. Press Enter or Return. An ODS2 Configuration screen is shown in Figure 530-1.

3. Starting at the top of Table 530-1 and working your way to the bottom, configure the ODS2 for the group and slot selected.

4. Assign the selections by pressing Enter or Return.

5. Repeat Steps 2 through 4 for each ODS2 module installed in the chassis.

Stop! You have completed this procedure.

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```
                        ODS2 CONFIGURATION
                             Group: 3
      Unit Equip State  : EQUIPPED       T2 Service State : IS
      Unit Service State: IS             BER Alarm  Thresh: 1E-8
      Unit Protect State: UNPROTECTED    BER Switch Thresh: 1E-6
        T1                    Service Line
        PARAMETERS  Provision State   Code Circuit ID
                    ========= ======= ==== ====================
            T1 #1:      YES     OOS   AMI
            T1 #2:      YES     OOS   AMI
            T1 #3:      YES     OOS   AMI
            T1 #4:      YES     OOS   AMI

        T1          Remote Pulse Remote        Remote PPS
        PARAMETERS  Equalization Frame Format  Threshold
                    ===========  ============  =============
            T1 #1:  N/A          N/A           N/A
            T1 #2:  N/A          N/A           N/A
            T1 #3:  N/A          N/A           N/A
            T1 #4:  N/A          N/A           N/A
Remote Housekeeping Labels:
       Working Card   HSKP1: RMT-HSKP1            HSKP2: RMT-HSKP2
       Protect Card   HSKP1: N/A                  HSKP2: N/A
                      Press CONTROL-A For Assistance
```

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Figure 530-1. ODS2 Configuration Screen

Table 530-1. ODS2 Configuration Fields

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Group	Toggle	1, 2, 3, 4, 5, 6, or 7	Specifies the module's group number designated on the chassis.	1
Unit Equipment State	Toggle	Equipped	Establishes communication with MPU. Module must be set to EQUIPPED before remaining selections are allowed. Sets all other fields to default values and allows MPU to process equipment alarms.	UNEQUIPPED
		UNEQUIPPED	No communication with MPU.	
Unit Service State	Toggle	IS (In-Service)	Places the unit in service and allows equipment alarm reporting by the MPU. Must be set to IS for reporting of equipment alarms.	OOS
		OOS (Out-Of-Service)	Removes unit from service and stops equipment alarm reporting by the MPU.	
Unit Protect State	Toggle	PROTECTED	Designates that equipment APS is available.	UNPROTECTED
		UNPROTECTED	Designates that equipment APS is not available.	

(continued)

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Table 530-1. ODS2 Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
T2 Service State	Toggle	Leave this field at OOS at this time to avoid undesirable reporting of alarms. Select IS after completing the remaining configurations.		OOS
BER Alarm Threshold	Toggle	Set to OFF or set between 10^{-6} and 10^{-10}	The average Bit Error Ratios of both the incoming optical signals are monitored by the ODS2. By monitoring BERs, the ODS2 is capable of triggering a minor alarm when any of the monitored signals degrades below the BER threshold level.	10^{-8}
BER Switch Threshold	Toggle	Set between 10^{-4} and 10^{-10}	This sets the threshold at which the APS will be executed.	10^{-6}
Provision (set for each T1)	Toggle	YES	Brings up T1 default settings and allows configuration changes.	NO
		NO	Facility not provisioned.	
T1 Service State	Toggle	Leave this field at OOS at this time to avoid undesirable reporting of alarms. Select IS after completing the remaining configurations.		OOS
Line Code (set for each T1)	Toggle	AMI	Alternate Mark Inversion	AMI
		B8ZS	Bipolar Eight-Zero Substitution	
Circuit Identifier (set for each T1)	Input	Enter up to 20 characters or leave blank.	Use alphanumeric characters; embedded hyphens are allowed.	None
Remote Pulse Equalization	Toggle	0–133 ft., 133–226 ft., 226–399 ft., 399–533 ft., 533–655 ft., or NOT APPL.	The DS1 signal output provides standard DSX signal levels which can be compensated for at various distances (i.e., cable length).	0–133 ft.
Remote Frame Format	Fixed	Locked at NOT APPL.		NOT APPL
Remote PPS (Path Protection Switch) Threshold	Fixed	Locked at NOT APPL.		NOT APPL
T2 Service State	Toggle	IS (In-Service)	Places facility in service and allows T2 alarm reporting by the MPU.	OOS
		OOS (Out-Of-Service)	Removes facility from service and stops T2 alarm reporting by the MPU.	
T1 Service State (set for each T1)	Toggle	IS (In-Service)	Places facility in service and allows T1 alarm reporting by the MPU.	OOS
		OOS (Out-Of-Service)	Removes facility from service and stops T1 alarm reporting by the MPU.	

HLX CONFIGURATION

Summary: This procedure provides instructions for using this menu to view or edit the configuration for each HLX module in the chassis. This menu can also be used to equip, provision, assign thresholds, and assign service state.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful…Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys or number keys to select Unit Configuration from the Main Menu. Press Enter or Return.

2. Use the arrow keys or number keys to select HLX Configuration from the Unit Configuration menu. Press Enter or Return. The HLX Configuration menu is shown in Figure 531-1.

3. Select HLX Unit Configuration from the HLX Configuration menu. Press Enter or Return. The HLX Unit Configuration menu is shown in Figure 531-2.

4. Starting at the top of Table 531-1 and working your way to the bottom, configure the HLXC for the group and slot selected.

5. Assign the selections by pressing Enter or Return.

6. Repeat Steps 4 through 5 for each HLXC module installed in the chassis.

Stop! You have completed this procedure.

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```
                    HLX CONFIGURATION


               1. HLX Unit Configuration
               2. Loopback Configuration




            Press CONTROL-A For Assistance
```

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Figure 531-1. HLX Configuration Menu

```
                            HLX UNIT CONFIGURATION
                 Group: 6    Slot: 1    Circuit ID:

Unit Equip State  : EQUIPPED             Loop Power Setting: ENABLED
Unit Service State: IS                   Loop 2 Operation  : ENABLED
T1 Provision      : YES                  Half AIS Feature  : ENABLED
T1 Service State  : OOS                  HDSL Service State: IS
T1 Framing Format : AUTO-UNFRAMED        HDSL BER Threshold: 1E-7
T1 BER Threshold  : 1E-7                 HDSL SNR Threshold: +5    dB
HLXC T1 Line Code : NOT APPL             HDSL PA Threshold : +33   dB
HLXC DSX-1 EQ     : NOT APPL             Network DS1 Source: NOT APPL
HLXR T1 Line Code : AUTO-AMI             Network Keep Alive: AIS
HLXR LBO Setting  : UNIT SWITCH          HLXR Simplex Power: NOT APPL

DS0 Channel:      1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
 (B = blocked)    . . . . . . . . .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
Blocked Channel Pattern:  11111111
Remote HSKP Labels:  HSKP1: RMT-HSKP1          HSKP2: RMPT-HSKP2
User Notes        :

HLXC Switch Settings - DSX-1 EQ      : NOT APPL        Loop Power: NOT APPL
HLXR Switch Settings - Simplex Power : NOT APPL        Loop 2 Op : NOT APPL
                                                       LBO       : 0.0  db
                       Press CONTROL-A For Assistance
```

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Figure 531-2. HLXC Unit Configuration Screen

Table 531-1. HLXC Configuration Fields

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Group	Toggle	1, 2, 3, 4, 5, 6, or 7	Specifies the module's group number designated on the chassis.	1
Slot	Toggle	1, 2, 3, or 4	Specifies the module's slot number within the group number designated on the chassis.	1
Circuit Identifier	Input	Enter up to 20 characters.	This represents the customer's circuit ID. The first character must be alpha or numeric; middle characters can be alpha, numeric, or hyphens; and the last character must be either alpha or numeric. Note: This field can be configured only after the T1 Provision field (described below) is set to YES.	Blank
Unit Equip State	Toggle	Equipped	Establishes communication with MPU. Module must be set to EQUIPPED before remaining selections are allowed.	UNEQUIPPED
		UNEQUIPPED	No communication with MPU.	
Unit Service State	Toggle	Leave this field at OOS at this time to avoid undesirable reporting of alarms. Set this field to IS after completing the configuration of the remaining fields.		
T1 Provision	Toggle	YES	Brings up T1 default settings and allows configuration changes.	NO
		NO	No configuration changes allowed.	
T1 Service State	Toggle	Leave this field at OOS at this time to avoid undesirable reporting of alarms. Set this field to IS after completing the configuration of the remaining fields.		
T1 Framing Format	Toggle	AUTO	The system automatically detects and establishes the current frame format (UNFRAMED, FT ONLY, SF, or ESF). It then displays "AUTO-" and the frame format.	AUTO
		UNFRAMED	Unframed data pattern.	
		Ft ONLY	Used for SLC framing.	
		SF	Super Frame	
		ESF	Extended Super Frame	
T1 BER Threshold	Toggle	From 10^{-3} to 10^{-9}	The average Bit Error Ratios of the incoming DS1 signals are monitored by the HLXC. By monitoring BERs, the HLXC is capable of triggering an alarm when any of the monitored signals degrades below the BER threshold level.	10^{-7}
HLXC T1 Line Code	Fixed	Locked at NOT APPL.		
HLXC DSX-1 EQ*	Fixed	Locked at NOT APPL.		

*Note: HLXC and HLXR Switch Settings (HLXC DSX-1 EQ, HLXR LBO, Loop Power, Loop 2 Operation, and HLXR Simplex Power) of the module being configured are displayed at the bottom of the screen.

(continued)

Table 531-1. HLXC Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
HLXR T1 Line Code	Toggle	AMI	Alternate Mark Inversion	AMI
		B8ZS	Bipolar Eight-Zero Substitution	
		AUTO	Specifies that the T1 line code transmitted by the HLXR will match the line code received by the HLXR.	
HLXR LBO Setting*	Toggle	UNIT SWITCH	Defaults to the Line Buildout hardware configuration settings on the HLXR.	Version C HLXC: UNIT SWITCH
		0.0 dB, 7.5 dB, 15.0 dB, or 22.5 dB	Sets the LBO in decibels for the HLXR.	Version E and Version D HLXC: 0.0 dB
Loop Power Setting*	Toggle	UNIT SWITCH	Defaults to the Loop Power hardware configuration settings on the Version C HLXC only. Refer to DLP 516 for more information about the Version C HLXC's unit switch.	Version C HLXC: UNIT SWITCH Version E and Version D HLXC: ENABLED
		ENABLED	When loop powering is on and an HRX is not connected to the HLXC, –130 VDC span power is supplied over the HDSL loops by the HLXC. When loop powering is on and an HRX is connected to the HLXC, ±130 VDC power is supplied over the HDSL loops. ENABLED must be selected if an HRX is used.	
		DISABLED	No loop power is supplied. A D1 HLXR is the only HLXR with a local powering option. All other HLXR modules must be loop powered.	
Loop 2 Operation‡*	Toggle	UNIT SWITCH	Defaults to the Loop 2 hardware configuration settings on the Version C HLXC.	Version C HLXC: UNIT SWITCH
		ENABLED	Channels 1 - 12 are transmitted on Loop 1 and channels 13 - 24 are transmitted on Loop 2.	Version E and Version D HLXC: ENABLED
		DISABLED	Single-loop operation is enabled by blocking 12 of the 24 DS0 channels (13 - 24) within the DS1 signal. Single-loop operation is used primarily when only one loop is available to provide service.	

*Note: HLXC and HLXR Switch Settings (HLXC DSX-1 EQ, HLXR LBO, Loop Power, Loop 2 Operation, and HLXR Simplex Power) of the module being configured are displayed at the bottom of the screen.

‡Note: The Version D and later HLXC module can be provisioned to provide fractional T1 service by deactivating one of the HDSL loops (Loop 2) or by selectively blocking specified channels. See the DS0 Channel and Blocked Channel Pattern fields.

(continued)

Table 531-1. HLXC Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Half AIS Feature	Toggle	ENABLED	This selection activates the Half AIS mode. An Alarm Indication Signal (all 1s) is generated on the outgoing DS1 path only when both HDSL loops are in a LOSW (Loss of Synch Word) state. In Half AIS mode when only one HDSL loop is in a LOSW state, the transmitted DS1 signal will continue to the payload containing transparent data in the 12 channels related to the operating loop. An all 1s pattern will fill the remaining 12 channels associated with the loop in the LOSW state.	DISABLED
		DISABLED	This selection activates the Full AIS mode. An AIS signal is generated on the outgoing DS1 path whenever either one or both HDSL loops are in a LOSW state.	
HDSL Service State	Toggle	IS (In-Service)	Allows HDSL alarms to be reported to the MPU, and enables HDSL PM data collection. Must be set to IS for reporting of equipment alarms.	OOS
		OOS (Out-Of-Service)	No HDSL alarms are reported to the MPU.	
HDSL BER Threshold	Toggle	Enter a number from 10^{-4} to 10^{-9}	The average Bit Error Ratios of the incoming HDSL signals are monitored by the HLXC. By monitoring BERs, the HLXC is capable of triggering a minor alarm when any of the monitored signals degrades below the BER threshold level.	10^{-7}
HDSL SNR Threshold	Toggle	Enter a number from –10 dB to +30 dB	The lowest Signal-to-Noise Ratio allowed on the HDSL loop before an alarm is triggered.	+5 dB
HDSL PA Threshold	Toggle	Enter a number from +1 dB to +40 dB	The highest Pulse Attenuation value allowed on the HDSL loop before an alarm is triggered.	+33 dB
Network DS1 Source	Toggle	NRZ	This tells the Craft that the network DS1 source is at the backplane from the DS3 MUX.	NRZ
		BIPOLAR	This tells the Craft that network DS1 source is at the Extender Card interface. If you select this option when you are not using an Extender Card, you will cut off the DS1 signal. See Section 4 of this manual for information about the Extender Card.	

(continued)

Table 531-1. HLXC Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Network Keep Alive	Toggle	**D2 HLXR only:** AIS	If the system detects a LOS (Loss of Signal) from the customer, an AIS or customer disconnect indication (DS1 Idle Code) is sent to the network. An AIS is sent if UNFRAMED is selected in the T1 Framing Format field. A DS1 Idle Code is sent if a framed format (Ft, SF or ESF) is selected in the T1 Framing Format field.	AIS
		All other HLXRs: AIS	If the system detects a LOS (Loss of Signal) from the customer, an AIS is sent to the network.	
		LOOPBACK	If the system detects a LOS from the customer, the signal is automatically looped back towards the network.	
		DS1 CUTOFF	If the system detects a LOS from the customer, the signal is cut off and no pattern is transmitted to the network.	
HLXR Simplex Power* **(D1/D2/D2A-SP/D3/ D3A HLXR only)**	Toggle	UNIT SWITCH	Defaults to the simplex power hardware configuration setting on the HLXR. Refer to the Soneplex Version D and Version E HLXR Remote System Operation and Maintenance Manual, listed under Related Publications at the beginning of this manual, for more information.	UNIT SWITCH (NOT APPL for D2A, D4, E4, F4, or G4 HLXR)
		ENABLED	A 60 mA constant current is applied to the DS1 terminals for powering NIDs or CSUs. Overrides the hardware setting on the HLXR.	
		DISABLED	Turns simplex power off. Overrides the hardware setting on the HLXR.	
DS0 Channel	Input	Enter “B” for DS0 Channel blocking or leave blank for normal operation for each of the 24 DS0 channels.	Blocking a channel causes the channel blocking pattern to be transmitted in both directions on the selected channel.	Blank
Versions D, E, and G HLXC: Blocked Channel Pattern	Input	Enter an eight-bit programmable code consisting of 1s and 0s.	Enter the pattern you want to use to block the channels you selected in the DS0 Channel field.	Blank (Version C HLXC is fixed at an all 1s pattern and is not configurable)
Remote Housekeeping Labels	Input	Enter up to 8 alphanumeric characters.	These fields can be edited to create customized labels. When a housekeeping alarm (door ajar, water on the floor, fire alarm, etc.) occurs, the name assigned is displayed in the condition column of the Alarm History and Active Alarms screens.	Blank

*Note: HLXC and HLXR Switch Settings (HLXC DSX-1 EQ, HLXR LBO, Loop Power, Loop 2 Operation, and HLXR Simplex Power) of the module being configured are displayed at the bottom of the screen.

(continued)

Table 531-1. HLXC Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Unit Service State	Toggle	IS (In-Service)	Places the unit in service and allows equipment alarm reporting by the MPU. Must be set to IS for reporting of equipment alarms.	OOS
		OOS (Out-Of-Service)	Removes unit from service and stops equipment alarm reporting by the MPU.	
T1 Service State	Toggle	IS (In-Service)	Places facility in service and allows T1 alarm reporting by the MPU, and enables DS1 PM data collection.	OOS
		OOS (Out-Of-Service)	Removes facility from service and stops alarm reporting by the MPU.	
User Notes	Input	Enter up to 30 alphanumeric characters.	Enter additional information in the space provided.	Blank

Note: HLXC Switch and HLXR Switch Setting fields display the switch settings of the module being configured.

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DLX CONFIGURATION

Summary: This procedure provides instructions for establishing initial configuration of DLX module(s) or view and/or edit the configurations for each DLX module in the Soneplex Broadband system. Equip, provision, assign thresholds as required, and assign service state.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful…Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys or number keys to select Unit Configuration from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select DLX Configuration from the Unit Configuration menu. Press Enter or Return. A DLX Configuration menu is shown in Figure 532-1.

3. Starting at the top of Table 532-1 and working your way to the bottom, configure the DLX.

4. Assign the selections by pressing Enter or Return.

5. Repeat Steps 3 and 4 for each DLX module installed in the chassis.

Stop! You have completed this procedure.

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```
                DLX CONFIGURATION

            Group: 5           Slot: 1

        Unit Equip State: EQUIPPED

      Unit Service State: IS

            T1 Provision: YES

        T1 Service State: OOS

            T1 Line Code: AMI

      Pulse Equalization: 0-133 FT.

        T1 BER Threshold: 1E-7

 Loopback Timeout Period: 0   minutes

              Circuit ID:

          Press CONTROL-A For Assistance
```

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Figure 532-1. DLX Configuration Screen

Table 532-1. DLX Configuration Fields

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Group	Toggle	1, 2, 3, 4, 5, 6, or 7	Specifies the module's group number designated on the chassis.	1
Slot	Toggle	1, 2, 3, or 4	Specifies the module's slot number designated on the chassis. Refer to TAD-106 (Access Identifier).	1
Unit Equip State	Toggle	Equipped	Establishes communication with MPU. Module must be set to EQUIPPED before remaining selections are allowed.	UNEQUIPPED
		Unequipped	No communication with MPU.	
Unit Service State	Toggle	IS (In-Service)	Places the unit in service. This field must be set to IS for reporting of equipment alarms.	OOS
		OOS (Out-Of-Service)	Removes unit from service and stops equipment alarm reporting by the MPU.	

(continued)

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Table 533-1. DLX Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
T1 Provision	Toggle	YES	Brings up T1 default settings and allows configuration changes.	NO
		NO	Prevents configuration settings.	
T1 Service State	Toggle	Leave this field at OOS at this time to avoid undesirable reporting of alarms. Place the circuit In-Service after complete the remaining configurations.		
T1 Line Code	Toggle	AMI	Alternate Mark Inversion	AMI
		B8ZS	Bipolar Eight-Zero Substitution	
Pulse Equalization	Toggle	0–133 ft., 133–266 ft., 266–399 ft., 399–533 ft., or 533–655 ft.	The DS1 signal output provides standard DSX signal levels which can be compensated for various distances.	0–133 ft.
T1 BER Threshold	Toggle	T1 BER Threshold can be set between 10^{-3} and 10^{-9}.	When the Bit Error Rate threshold is exceeded, an alarm is triggered.	10^{-7}
Loopback Timeout Period	Input	Enter a number from 0 to 255.	This field represents the number of minutes that the loopback remains in effect before reverting to the normal (non-loopback) state. Setting the loopback time-out period to 0 disables the time-out feature.	30
Circuit Identifier	Input	Up to 20 characters.	This represents the customer's circuit ID. The first and last characters must be alpha or numeric; middle characters can be alpha, numeric or hyphens.	None
T1 Service State	Toggle	IS (In-Service)	Allows T1 alarms to be reported to the MPU.	OOS
		OOS (Out-Of-Service)	Prevents T1 alarms from being reported to the MPU.	

RLXIOR CONFIGURATION

Summary: This procedure provides instructions for configuring the RLXIOR module. The RLXIOR configuration process assumes that the MPU is installed and the Craft Interface is operating. Configure each RLXIOR module in the Soneplex Broadband/Loop Extender system. Equip, provision, assign thresholds as required, and assign service state.

➧ **Note:** A “toggle” field type means the user can press the space bar to view and select the next option that is described; or the user can press the “R” key to view and select the previous option. An “input” field type means the user must type an entry in the field according to the parameters described. A “fixed” field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Log on to the Craft Interface. The Main Menu appears.

2. Use the arrow keys or number keys to select Unit Configuration from the Main Menu. Press Enter or Return.

3. Use the arrow keys to select RLX Configuration from the Unit Configuration menu. Press Enter or Return. The RLX Configuration screen appears, as shown in Figure 533-1.

   ➧ **Note:** The RLXIOR is displayed as “RLX” in the Craft Interface menus and screens.

4. Starting at the top of Table 533-1 and working your way to the bottom, configure the RLXIOR.

5. Assign the selections by pressing Enter or Return.

6. Repeat Steps 4 and 5 for each RLXIOR module installed in the chassis.

Stop! You have completed this procedure.

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```
                              RLX CONFIGURATION

                 Group: 1    Slot: 1    Circuit ID:

Unit Equip State  : EQUIPPED         Pulse Equalization       : NOT APPL
Unit Service State: OOS              LBO Setting              : UNIT SWITCH
T1 Provision      : YES              Programmable Loopback    : DISABLED
T1 Service State  : OOS              NID Loopback             : ENABLED
Line Code         : AMI              Loopback Activation Code : 1101001111010011
Framing Format    : AUTO             Loopback Deactivate Code : 1001001110010011
Network DS1 Source: NRZ              Lpbk Timeout Disable Code: 1101010111010110
BER Threshold     : 1E-7             Loopback Timeout Period  : 0   minutes
Span Power Setting: ENABLED          Network Keep Alive       : AIS

DS0 Channel       1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
 (B = blocked)    . . . . . . . . .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .

Unit Switch Settings:  Pulse Equalization: NOT APPL        Span Power: DISABLED
                                      NID: DISABLED              LBO: 7.5  dB

                        Press CONTROL-A For Assistance
```

11783-A

Figure 533-1. RLX Configuration Screen (Broadband Chassis)

Note: The Unit Service State field default is UNEQUIPPED and the T1 Provision field default is NO. When the Unit Service State field is set to EQUIPPED and the T1 Provision field is set to YES, this screen shows all other field defaults, as above.

Table 533-1. RLXIOR Configuration Fields

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT*
Group	Toggle	1, 2, 3, 4, 5, 6, or 7 (groups 6 and 7 are not available in the 19-inch LEC chassis)	Specifies the module's group number designated on the chassis.	1
Slot	Toggle	1, 2, 3, or 4	Specifies the module's slot number in the group designated on the chassis.	1
Circuit Identifier	Input	Enter up to 20 characters	This represents the customer's circuit ID. The first and last characters must be alpha or numeric; middle characters can be alpha, numeric, or hyphens.	Blank
Unit Equip State	Toggle	Equipped	Establishes communication with the MPU. Module must be set to EQUIPPED before remaining selections are allowed.	UNEQUIPPED
		Unequipped	No communication with the MPU.	

*Note: The RLXIOR configuration field default values shown in this manual are valid for a system with an MPU installed.

(continued)

Table 533-1. RLXIOR Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT*
Unit Service State	Toggle	Leave this field at OOS at this time to avoid undesirable reporting of alarms. Set this field to IS after completing the configuration of the remaining fields.		
T1 Provision	Toggle	YES	Brings up T1 default settings and allows configuration changes.	NO
		NO	No configuration changes allowed.	
T1 Service State	Toggle	Leave this field at OOS at this time to avoid undesirable reporting of alarms. Set this field to IS after completing the configuration of the remaining fields, and after configuring the Unit Service State field.		
Line Code	Toggle	AUTO	When the RLX line code is set to AUTO, the module senses the line code and switches from AMI to B8ZS if an encoded signal is detected. After switching to B8ZS, the RLX stays locked in this line code until an LOS is detected at both DS1 inputs.	AMI
		AMI	Alternate Mark Inversion	
		B8ZS	Bipolar Eight-Zero Substitution	
Framing Format	Toggle	AUTO	The system automatically detects, establishes, and displays “AUTO-NR-” and the correct frame format (UNFRAMED, FT ONLY, SF, or ESF).	AUTO
		UNFRAMED	Unframed data pattern	
		Ft ONLY	Used for SLC framing	
		SF	Super Frame	
		ESF	Extended Super Frame	
Network DS1 Source	Toggle	NRZ	This tells the Craft that the network DS1 source is at the backplane.	NRZ (Broadband chassis only)
		BIPOLAR	This tells the Craft that the network DS1 source is at the extender card interface. If this option is selected and there is no extender card, the DS1 signal is cut off. In the Loop Extender chassis, this field is locked at BIPOLAR.	BIPOLAR (locked field in Loop Extender chassis only)
BER Threshold	Toggle	Range of 10^{-3} to 10^{-9}	The average Bit Error Ratios of both the incoming DS1 signals are monitored by the RLX. By monitoring BERs, the RLX is capable of triggering a minor alarm when any of the monitored signals degrades below the BER threshold level.	10^{-7}

*Note: The RLXIOR configuration field default values shown in this manual are valid for a system with an MPU installed.

(continued)

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Table 533-1. RLXIOR Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT*
Span Power Setting**	Toggle	UNIT SWITCH	Stops span power on the RLXIOR.	ENABLED
		ENABLED	Enables span power using the on-board switch settings (–130V or ±130V). The default switch setting is –130V.	
		DISABLED	Stops span power on the RLXIOR.	
Pulse Equalization**	Toggle	UNIT SWITCH	Selecting this option on the RLXIOR creates a setting of 0–133 ft.	UNIT SWITCH (Loop Extender chassis only)
		0–133 ft., 133–266 ft., 266–399 ft., 399–533 ft., or 533–655 ft.	The DS1 signal output provides standard DSX signal levels which can be compensated for various distances.	NOT APPL (locked field in Broadband chassis only)
LBO Setting**	Toggle	UNIT SWITCH	Selecting this option on the RLXIOR creates a setting of 0.0 dB.	UNIT SWITCH
		0.0 dB, 7.5 dB, 15.0 dB, or 22.5 dB	Sets the LBO in decibels.	
Programmable Loopback	Toggle	ENABLED	Enables response to programmable loopback codes.	DISABLED
		DISABLED	Disables response to programmable loopback codes.	
NID Loopback**	Toggle	UNIT SWITCH	Disables loop-up response to NID arming code. The loopback armed state transitions to "Armed" when the NID arming code is received.	ENABLED
		ENABLED	Enables response to NID loopback codes.	
		DISABLED	Disables loop-up response to NID arming code. The loopback armed state transitions to "Armed" when the NID arming code is received.	

*Note: The RLXIOR configuration field default values shown in this manual are valid for systems with an MPU installed.

**Note: Although unit switch settings (Pulse Equalization, Span Power, NID Loopback, and LBO) are shown at the bottom of the configuration screen, none of the displays are meaningful for the RLXIOR. First, there are no on-board switches for Pulse Equalization, NID Loopback, and LBO. In addition, although the RLXIOR has an on-board Line Power switch, the Span Power unit switch setting display is locked at “DISABLED”.

(continued)

Table 533-1. RLXIOR Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT*
Loopback Activation Code	Input	16 binary characters (0's and 1's) must be entered.	These codes can be set to any 16-bit binary value except: all 0s, all 1s, or a value that is already used in another 16-bit code. The Loopback Activation Code signal is sent inband. RLX units go to loopup state when they are in armed state. Loopup is activated for selected units. Detection time is 3 secs.	1101 0011 1101 0011
Loopback Deactivate Code	Input		The signal is sent inband. Units in loopup state go back to armed state. Detection time is 5 secs.	1001 0011 1001 0011
Lpbk Timeout Disable Code	Input		This disables loopup time-out. Active loopbacks stay up until deactivation or disarm (NID Loop Down) code is received. Detection time is 3 secs.	1101 0101 1101 0110
Loopback Timeout Period	Input	Enter a number from 0 to 255.	This represents the minutes the loopback remains in effect before reverting to the non-loopback state. Setting the loopback time out period to 0 disables the time out feature.	0 minutes
Network Keep Alive	Toggle	AIS	If the system detects an LOS (Loss of Signal) from the customer, an AIS is sent to the network.	AIS
		DS1 CUTOFF	If the system detects an LOS from the customer, the signal is cut off and no signal is transmitted to the network.	
DS0 Channel	Toggle	"B" (for DS0 Channel blocking) or blank (for normal operation) for each of the 24 DS0 channels.	Blocking a channel causes the blocking pattern (FFhex or 7Fhex) set up via the onboard DIP switch to be transmitted in both directions.	Blank
Unit Service State	Toggle	IS (In-Service)	Places the unit in service and allows equipment alarm reporting by the MPU. Must be set to IS for reporting of equipment alarms.	OOS
		OOS (Out-Of-Service)	Removes unit from service and stops equipment alarm reporting by the MPU.	
T1 Service State	Toggle	IS (In-Service)	Places facility in service and allows T1 alarm reporting by the MPU.	OOS
		OOS (Out-Of-Service)	Removes facility from service and stops alarm reporting by the MPU.	

*Note: The RLXIOR configuration field default values shown in this manual are valid for systems with an MPU installed.

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RLX CONFIGURATION

Summary: This procedure provides instructions for establishing initial configuration of Version A RLX and Version B RLX (B1 RLX and B2 RLX+) modules, viewing, and/or editing the configurations for each RLX module in the Soneplex Broadband system.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful…Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys or number keys to select Unit Configuration from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select RLX Configuration from the Unit Configuration menu. Press Enter or Return. An RLX Configuration menu is shown in Figure 534-1.

3. Starting at the top of Table 534-1 and working your way to the bottom, configure the RLX fields for the group and slot selected.

4. Assign the selections by pressing Enter or Return.

5. Repeat Steps 3 and 4 for each RLX module installed in the chassis.

Stop! You have completed this procedure.

```
                         RLX CONFIGURATION

             Group: 1    Slot: 1    Circuit ID:

Unit Equip State  : EQUIPPED        Pulse Equalization       : NOT APPL
Unit Service State: OOS             LBO Setting              : UNIT SWITCH
T1 Provision      : YES             Programmable Loopback    : DISABLED
T1 Service State  : OOS             NID Loopback             : UNIT SWITCH
Line Code         : AUTO            Loopback Activation Code : 1101001111010011
Framing Format    : AUTO            Loopback Deactivate Code : 1001001110010011
Network DS1 Source: NRZ             Lpbk Timeout Disable Code: 1101010111010110
BER Threshold     : 1E-7            Loopback Timeout Period  : 0   minutes
Span Power Setting: UNIT SWITCH     Network Keep Alive       : AIS

DS0 Channel       1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
 (B = blocked)    . . . . . . . . .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .

Unit Switch Settings:  Pulse Equalization: NOT APPL        Span Power: DISABLED
                                      NID: DISABLED               LBO: 7.5  dB

                    Press CONTROL-A For Assistance
```

6127-C

Figure 534-1. RLX Configuration Screen

Table 534-1. RLX Configuration Fields

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Group	Toggle	1, 2, 3, 4, 5, 6, or 7 (groups 6 and 7 are not available in the 19-inch chassis)	Specifies the module's group number designated on the chassis.	1
Slot	Toggle	1, 2, 3, or 4	Specifies the module's slot number designated on the chassis.	1
Circuit Identifier	Input	Enter up to 20 characters	This represents the customer's circuit ID. The first and last characters must be alpha or numeric; middle characters can be alpha, numeric, or hyphens.	Blank
Unit Equip State	Toggle	Equipped	Establishes communication with MPU. Module must be set to EQUIPPED before remaining selections are allowed.	UNEQUIPPED
		Unequipped	No communication with MPU.	

(continued)

Table 534-1. RLX Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Unit Service State	Toggle	IS (In-Service)	Places the unit in service and allows equipment alarm reporting by the MPU. Must be set to IS for reporting of equipment alarms.	OOS
		OOS (Out-Of-Service)	Removes unit from service and stops equipment alarm reporting by the MPU.	
T1 Provision	Toggle	YES	Brings up T1 default settings and allows configuration changes.	NO
		NO	No configuration changes allowed.	
T1 Service State	Toggle	Leave this field at OOS at this time to avoid undesirable reporting of alarms. Set this field to IS after completing the configuration of the remaining fields.		
Line Code	Toggle	AUTO	When the RLX line code is set to AUTO, the module senses the line code and switches from AMI to B8ZS if an encoded signal is detected. After switching to B8ZS, the RLX stays locked in this line code until an LOS is detected at both DS1 inputs.	AMI
		AMI	Alternate Mark Inversion	
		B8ZS	Bipolar Eight-Zero Substitution	
Framing Format	Toggle	AUTO	The system automatically detects, establishes, and displays “AUTO-NR-” and the correct frame format (UNFRAMED, FT ONLY, SF, or ESF).	AUTO
		UNFRAMED	Unframed data pattern	
		Ft ONLY	Used for SLC framing	
		SF	Super Frame	
		ESF	Extended Super Frame	
Network DS1 Source	Toggle	NRZ	This tells the Craft that the network DS1 source is at the backplane from the DS3 MUX.	NRZ
		BIPOLAR	This tells the Craft that the network DS1 source is at the bipolar DS1 interface. If you select this option when you are in a Broadband chassis, you will cut off the DS1 signal. This option is used in the Loop Extender system. See Section 4 of this manual for information about the Extender Card.	

(continued)

Table 534-1. RLX Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
BER Threshold	Toggle	Range of 10^{-3} to 10^{-9}	The average Bit Error Ratios of both the incoming DS1 signals are monitored by the RLX. By monitoring BERs, the RLX is capable of triggering a minor alarm when any of the monitored signals degrades below the BER threshold level.	10^{-7}
Span Power Setting*	Toggle	UNIT SWITCH†	Defaults to the span power hardware configuration (DIP SWITCH) setting on the Version A RLX only.	Version A only: UNIT SWITCH
		ENABLED	Allows span power on the Version B RLX. To activate this selection, its jumper must be set to either ±130V or –130V as shown in Figure 525-2 or Figure 525-3.	Version B only: ENABLED
		DISABLED	Stops span power on the Version B RLX.	
Pulse Equalization*	Fixed	Locked at NOT APPL.		
LBO Setting*†	Toggle	UNIT SWITCH	Defaults to the hardware configuration (DIP SWITCH) LBO setting on the Version A RLX.	Version A only: UNIT SWITCH
		0.0 dB, 7.5 dB, 15.0 dB, or 22.5 dB	Version A only: Overrides the hardware configuration (DIP SWITCH) setting. Sets the LBO in decibels. Version B only: Sets the LBO in decibels.	Version B only: 0.0 dB
Programmable Loopback	Toggle	ENABLED	Enables response to programmable loopback codes and overrides hardware configuration settings.	DISABLED
		DISABLED	Disables response to programmable loopback codes and overrides hardware configuration settings.	

*Note: Unit switch settings (Pulse Equalization, Span Power, NID, and LBO) are shown on the bottom of the configuration screen.
†Note: The UNIT SWITCH option appears on screen for both RLX types, but is only functional for Version A.

(continued)

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Table 534-1. RLX Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
NID Loopback*†	Toggle	UNIT SWITCH	Selects NID setting (either enabled [default] or disabled) on the Version A RLX. When the Version A is provisioned to function like an NID, it supports inband and out-of-band loopback codes.	Version A only: UNIT SWITCH Version B only: DISABLE
		ENABLE	Enables response to NID loopback codes and overrides hardware configuration settings.	
		DISABLE	Disables response to NID loopback codes and overrides hardware configuration settings.	
Loopback Activation Code	Input	16 binary characters (0's and 1's) must be entered.	These codes can be set to any 16-bit binary value except: all 0s, all 1s, or a value that is already used in another 16-bit code. The signal is sent inband. RLX units go to loopup state when they are in an armed state. Loopup is activated for selected units. Detection time is 3 secs.	1101 0011 1101 0011
Loopback Deactivate Code	Input		The signal is sent inband. Units in loopup state go back to armed state. Detection time is 5 secs.	1001 0011 1001 0011
Lpbk Timeout Disable Code	Input		This disables the loopup time-out. Active loopbacks stay up until deactivation or disarm code is received. Detection time is 3 secs.	1101 0101 1101 0110
Loopback Timeout Period	Input	Enter a number from 0 to 255	This represents the minutes the loopback remains in effect before reverting to the non-loopback state. Setting the loopback time out period to 0 disables the time out feature.	30 minutes
Network Keep Alive	Toggle	AIS	If the system detects a LOS (Loss of Signal) from the customer, an AIS is sent to the network.	AIS
		DS1 CUTOFF	If the system detects a LOS from the customer, the signal is cut off and no signal is transmitted to the network.	

*Note: Unit switch settings (Pulse Equalization, Span Power, NID, and LBO) are shown on the bottom of the configuration screen.
†Note: The UNIT SWITCH option appears on screen for both RLX types, but is only functional for Version A.

(continued)

Table 534-1. RLX Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
DS0 Channel	Toggle	"B" (for DS0 Channel blocking) or blank (for normal operation) for each of the 24 DS0 channels.	Version A: blocking a channel causes all 1s pattern to be transmitted in both directions on the channel. Version B: blocking a channel causes the blocking pattern (FFhex or 7Fhex) set up via the onboard jumper to be transmitted in both directions.	Blank
T1 Service State	Toggle	IS (In-Service)	Places facility in service and allows T1 alarm reporting by the MPU.	OOS
		OOS (Out-Of-Service)	Removes facility from service and stops alarm reporting by the MPU.	

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USER ACCOUNT EDITING

Summary: This procedure provides instructions to system administrators for editing user account names and passwords, and for establishing privilege levels to regulate user access to various menus.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select System Administration from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Edit User Accounts from the System Administration menu. Press Enter or Return. An Edit User Accounts menu is shown in Figure 535-1.

3. Move the cursor to the **User Number** field. The number "1" appears. A number from 1 to 25 can be selected. The Craft Interface database allows up to twenty-five users to be entered. Use the space bar to select the user number, stopping when no user name appears on the screen.

4. Use the arrow keys to move the cursor to the **User Name** field. Enter the user name (i.e., logon). The system allows a one character minimum and ten character maximum. Only ASCII alpha, numeric, or hyphen characters are allowed. Single word User Names in all upper or lower case are easiest to remember. If there is already a user name assigned, a new user name can be entered replacing the existing user name. This field is case-sensitive.

5. Use the arrow keys to move the cursor to the **Password** field. A maximum of ten characters can be entered in this field. A minimum of two characters with one character being a number is required. Only ASCII alpha, numeric, or hyphen characters are allowed. At the Password field, type the password. If there is already a password assigned, a new password can be entered replacing the existing password. This field is case-sensitive.

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6. Use the arrow keys to move the cursor to the **Privilege Level** field. Use the space bar to select the privilege level. The lowest security level is 1, and the highest level is 5.
   - Users assigned Level 5 have access to all menu selections; Level 5 is assigned to the system administrator.
   - Level 3 is often assigned to the operating technician; these users have access to Levels 1, 2, and 3.
   - Level 2 is normally assigned to a local technician; these users have access to Levels 1 and 2.
   - Users assigned Level 1 have access to only those menus assigned a Level 1.
7. Use the arrow keys to move to the **Expiration Period** field. Type in a number (0 to 999) to represent how many days remain before the password expires. If zero is selected, the password has no expiration period and the **Number of Days Left** field will display “N/A."
8. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

```
          EDIT USER ACCOUNTS

     User Number      : 1
     User Name        : SONEPLEX
     Password         : SONEPLEX1
     Privilege Level  : 5
     Expiration Period: 0
     Number Days Left : N/A




     Press CONTROL-A For Assistance
```

6156-A

Figure 535-1. Edit User Account Screen

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MENU SECURITY EDITING

Summary: This procedure provides instructions to system administrators for assigning or changing access user privilege levels to the Craft Interface menus.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select System Administration from the Main Menu. Press Enter or Return.

2. Select Edit Menu Security from the System Administration menu. Press Enter or Return. An Edit Menu Security screen (with default settings) appears as shown in Figure 536-1.

3. Use the arrow keys to move the cursor to the **Privilege** toggle field. Use the space bar to select the privilege level (1 to 5). The lowest security level is 1; the highest level is 5.
   - Users assigned Level 5 have access to all menu selections; Level 5 is assigned to the system administrator.
   - Level 3 is often assigned to the operating technician; users have access to Levels 1, 2, and 3.
   - Level 2 is normally assigned to a local technician; users have access to Levels 1 and 2.
   - Users assigned Level 1 have access to only those menus assigned a Level 1.

4. Repeat Step 3 for each Main Menu Selection that you wish to change.

   ➧ **Note:** Disregard the QLX Alarm Levels and QLX Configuration selections. The MPU software installed is used with either the Soneplex Broadband system or the Soneplex Loop Extender. QLX modules are not used in the Broadband chassis.

5. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

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```
                              EDIT MENU SECURITY

Menu or Command            Privilege   Menu or Command                Privilege
========================== =========   ============================== =========
 Clear Alarm History      :     2       Edit Menu Security           :    5
 Set MPU Alarm Levels     :     2       System TID/Time/Date         :    3
 Set MUX Alarm Levels     :     2       Serial Port Configuration    :    3
 Set ODS2 Alarm Levels    :     2       X.25 Configuration           :    3
 Set QLX Alarm Levels     :     2       Shelf Housekeeping Alarms    :    3
 Set HLX Alarm Levels     :     2       Force/APS Commands           :    3
 Set RLX Alarm Levels     :     2       Reset/LED Test Commands      :    3
 Set DLX Alarm Levels     :     2       Execute ACO                  :    3
 MUX Configuration        :     2       Loopback Status/Commands     :    3
 ODS2 Configuration       :     2       Upload Configuration Data    :    3
 QLX Configuration        :     2       Download Configuration Data  :    3
 HLX Configuration        :     2       Download Application Software:    3
 RLX Configuration        :     2       DS1 Perf. Mon. Configuration :    3
 DLX Configuration        :     2       HDSL Perf. Mon. Configuration:    3
 Edit User Accounts       :     5       Test Access Unit Commands    :    3


                        Press CONTROL-A For Assistance
```

14854-A

Figure 536-1. Edit Menu Security Screen (with Defaults)

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FORCE/APS COMMANDS

Summary: This procedure provides instructions for using manual (forced switching) and automatic protection switching commands with the DS3 MUX and ODS2 modules. Executing one of the Force commands forces the working or protect module online. Executing the Enable APS or Disable APS command enables or disables Automatic Protection Switching (APS).

➧ **Note:** A “toggle” field type means the user can press the space bar to view and select the next option that is described; or the user can press the “R” key to view and select the previous option. An “input” field type means the user must type an entry in the field according to the parameters described. A “fixed” field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

➧ **Note:** Commands can be initiated on more than one unit by using the arrow keys to move to each unit and pressing the space bar to select each unit.

1. Use the arrow keys to select System Maintenance from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Force/APS Commands from the System Maintenance Menu. Press Enter or Return. A Force/APS Command screen is shown in Figure 537-1.

3. Use the arrow keys to move to the Command field. Use the space bar to select blank space (which means “make no changes”), FORCE TO WORKING, FORCE TO PROTECT, Enable APS, or Disable APS for each ODS2 pair and DS3 MUX pair installed in chassis.

   Reference: TAD-106 Access Identifier

➧ **Note:** Status will only appear for those units that have switching capability and are configured as protected.

4. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

```
                               FORCE / APS COMMANDS


                      Online Unit  APS / Lockout Status  Command
                      ===========  ====================  ========================

MUX (MXW/MXP)      :

DS2 Group 1        :  WORKING      ENABLED  / UNLOCKED
DS2 Group 2        :
DS2 Group 3        :
DS2 Group 4        :
DS2 Group 5        :
DS2 Group 6        :
DS2 Group 7        :




                         Press CONTROL-A For Assistance
```

6663-B

Figure 537-1. Force/APS Commands Screen

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RESET/LED TEST COMMANDS

Summary: This procedure provides instructions for performing a software reset and reinitialization, or to test the indicators on selected modules. Resets and LED Tests cannot be performed at the same time.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

➧ **Note:** Commands can be initiated on more than one module by using the arrow keys to move to each module and pressing the space bar to select each module.

1. Use the arrow keys to select System Maintenance from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Reset/LED Test Commands from the System Maintenance menu. Press Enter or Return. A Reset/indicator Test Commands screen is shown in Figure 538-1.

3. Use the arrow keys to move to the desired module's **Group-Slot** selection field.

   Reference: TAD-106 Access Identifier

   - To perform an **LED test**, use the space bar to select L. The LED test turns all the indicators yellow on the module(s) selected. A yellow indicator verifies that the module is functional.
   - To perform a **Reset**, use the space bar to select R. Resets performed through the Craft Interface are soft. A soft reset on the MPU causes a system restart and logs off all current users on all ports. A soft reset on the DS3 MUX, ODS2, HLXC, DLX, and RLX modules allows the current configuration to be left in place, but the collection of data is stopped for several seconds. Any soft reset will not affect traffic.

4. Assign the selections by pressing Enter or Return. If Reset is selected, a pop-up appears as shown below:

Are You Sure? (y/n)

Press Y for yes or N for no.

Stop! You have completed this procedure.

```
                           RESET / LED TEST


                    Low Speed Units (Group-Slot)
     =======================================================
M M    1 -     2 -     3 -     4 -     5 -     6 -     7 -      M
X X  ------- ------- ------- ------- ------- ------- -------    P
W P  1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4   U
===  ======= ======= ======= ======= ======= ======= =======    =
     .               R   R           .       .       .          .

    (Legend:  L = Perform LED Test,  R = Execute Unit Reset)





                    Press CONTROL-A For Assistance
```

6664-D

Figure 538-1. Reset/LED Test Screen

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ACO (ALARM CUT-OFF) COMMAND

Summary: This procedure provides instructions for silencing currently active audible alarms. Any new alarms will cause the audible alarm relay to be activated again and the ACO state canceled.

1. Use the arrow keys to select System Maintenance from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Execute ACO (Alarm Cut-Off) from the System Maintenance Menu.

3. Press Enter or Return to activate the ACO.

4. The following message appears across the screen and is shown in Figure 539-1.

ACO Executed

Press any key to continue

Stop! You have completed this procedure.

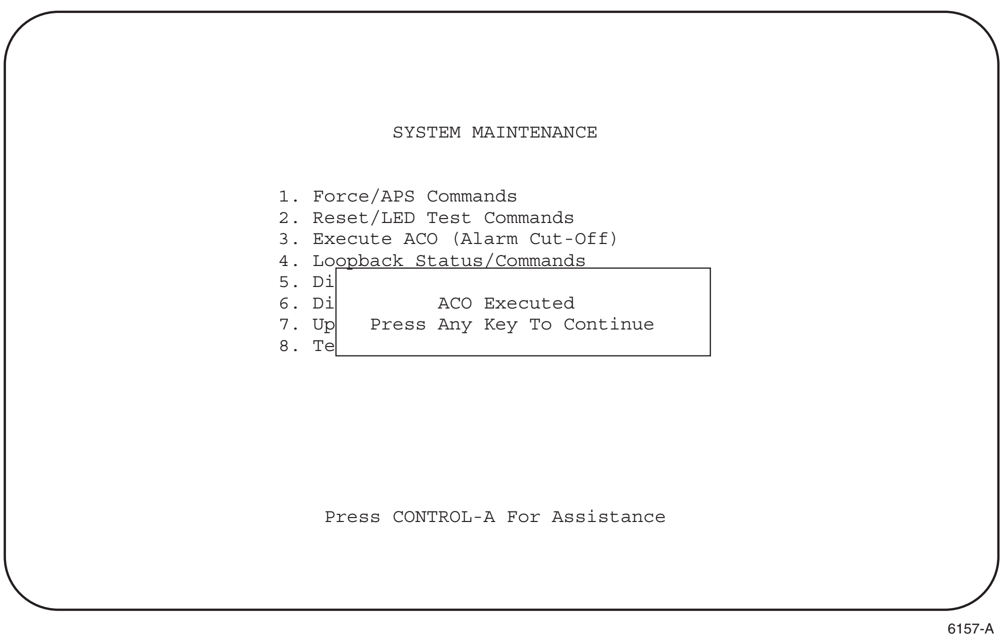

Figure 539-1. ACO Executed Message

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INVENTORY DISPLAY

Summary: This procedure provides instructions for displaying inventory information for the modules installed in the Soneplex Broadband chassis and modules installed at the remote locations. The inventory displayed is current at the time the request is made. A valid inventory display may not be available for up to a minute after the initial MPU startup.

Note: Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select System Maintenance from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Display Inventory from the System Maintenance Menu. Press Enter or Return. The Inventory Status screen is shown in Figure 540-1.

Stop! You have completed this procedure.

```
                                  INVENTORY STATUS

                              TID: ADC

Unit                  Part       ADC Catalog  Serial     Date S/W     CLEI
Identifier            Number     Number       Number     Code Version Code
===================== ========== ============ ========== ==== ======= ==========
MPU W/ BOOT CODE                                                 2.0
MPU APPLICATION S/W                                              5.0

DS3MUX WORKING        NO DATA PRESENT
       PROTECT        NO DATA PRESENT

LIU-1-1 LOCAL         NO DATA PRESENT
        REMOTE        NO DATA PRESENT
LIU-1-2 LOCAL         NO DATA PRESENT
        REMOTE        NO DATA PRESENT
LIU-1-3 LOCAL         NO DATA PRESENT
        REMOTE        NO DATA PRESENT
LIU-1-4 LOCAL         NO DATA PRESENT


Page  1 of  6            Press CONTROL-A for assistance
```

6766-B

Figure 540-1. Inventory Status Screen (Typical)

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LOOPBACK STATUS/COMMANDS

Summary: This procedure provides instructions for displaying the currently active loopbacks for all circuits in the system, and for enabling/disabling loopbacks.

Caution: *Do not perform a DS3 loopback when the Soneplex Broadband chassis is connected to a DS3 CAM unit in the Soneplex CCAS system.*

Note: Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space of the field is highlighted, type in the data that applies to that field.

Note: Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message “Configuration Successful… Press Any Key To Continue” appears on the screen.

Note: Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow or number keys to select System Maintenance from the Main Menu. Press Enter or Return. The System Maintenance menu is shown in Figure 541-1.

2. Use the arrow or number keys to select Loopback Status/Commands from the System Maintenance Menu. Press Enter or Return. The Loopback Status/Commands menu is shown in Figure 541-2.

3. Use the arrow or number keys to select High Speed Loopback Status/Commands or Low Speed Loopback Status/Commands, then press Enter or Return. The High Speed Loopback Status/Commands screen appears, as shown in Figure 541-3. The Low Speed Loopback Status/Commands screen appears, as shown in Figure 541-4.

4. **Low Speed only:** move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

5. **Low Speed only:** move to the **DS1#** toggle field. Select DS1 number 1, 2, 3, or 4.

6. Use the arrow keys to move to one of the **Local**, **Repeater, Repeater1, Repeater2**, or **Remote Loopback** command toggle fields.

7. Select ACT NET, ACT CUST, SEND LPBK (at Local field only), or DEACTIVATE at each field. Press Enter or Return. (Refer to Table 541-1 for loopback toggle field options.) A blank field indicates no selection.

➧ **Note:** The ACT CUST and ACT NET options create customer and network loopbacks on the HLXC and HLXR cards. The SEND LPBK option does not apply to loopbacks on the local HLXC or HLXR cards. Instead, the SEND LPBK option sends a request out to the DS3 MUX and into the network to request that a loopback be established on the associated DS1 facility at the other end of the network connection. This request is denoted graphically by the text "<LPBK RQ" that appears on loopback screens.

The corresponding DS1 on the other side of the network connection should respond to this request by establishing a loopback on the corresponding remote unit. The receipt of this request via the DS3 network interface is denoted graphically by the text "LPBK RQ>" that appears on loopback screens.

➧ **Note:** The SEND LPBK option is only available in the Soneplex Broadband system. It can only be executed from the Local command toggle field on the Loopback Status/Commands screen when the DS1 Loopback Mode field on the DS3 MUX Configuration screen is configured as C-Bit parity.

Reference: DLP-529 DS3 MUX Configuration

➧ **Note:** The "DEACTIVATE" command can be performed at any field that does not display "N/A", and will deactivate all loopbacks. You must deactivate the currently active loopback to activate another loopback.

➧ **Note**: Only applicable loopback actions for the unit will be displayed.

8. The following message appears:

```
Modifying LOOPBACK status…
   Are You Sure? (y/n)
```

9. Enable your selection by pressing Y for yes or cancel your selection by pressing N for no. When you press Y, the screen will disappear for a few seconds. The screen will then display the currently active loopback.

➧ **Note:** The **Programmable Loopback Armed State** read-only field displays either ARMING DISABLED or ARMED. [loopback arming TAP]

Reference: DLP-573 HLX Loopback Configuration

➧ **Note:** At the MPU 5.2 Craft Interface when both loops on any HDSL loop segment are down, no loopbacks at units downstream of the condition may be activated. The Loopback screen will show "N/A" under the name of any affected unit's column (i.e., LOCAL, REPEATER, REPEATER1, REPEATER2, or REMOTE). HDSL loop segments that may be affected include the loops between:

- the HLXC and the HLXR (no repeater)
- the HLXC and the HRX (one repeater)
- the HRX and the HLXR (one repeater)
- the HLXC and the HRX1 (two repeaters)

- the HRX1 and the HRX2 (two repeaters)
- the HXR2 and the HLXR (two repeaters)

For example, if an HDSL loop failure occurs on both loops between the HRX and the HLXR (one repeater), the REMOTE column will show “N/A”.

When both loops on an HDSL segment go down **and** a loopback is already in progress at one of the affected units, the loopback will continue to appear as if it is still in progress on the screen, although it will no longer function on the loops. However, the loopback will still need to be deactivated before another loopback can be initiated.

For descriptions of alarms arising from fault conditions (such as HDSL loop failures), refer to TAP-101 (Alarm Troubleshooting).

Stop! You have completed this procedure.

```
SYSTEM MAINTENANCE

1. Force/APS Commands
2. Reset/LED Test Commands
3. Execute ACO (Alarm Cut-Off)
4. Loopback Status/Commands
5. Display Inventory
6. Display Circuit IDs
7. Upload/Download Commands
8. Test Access Unit Commands

Press CONTROL-A For Assistance
```

5323-A

Figure 541-1. System Maintenance Menu

```
Loopback Status/Commands

1. High Speed Loopback Status/Commands
2. Low Speed Loopback Status/Commands

Press CONTROL-A For Assistance
```

6132-A

Figure 541-2. Loopback Status/Commands Menu

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DS3 MUX LOOPBACK SELECTION FIELD

```
                  High Speed Loopback Status/Commands


            Unit Location -      LOCAL
                               ===========
           COMMANDS:
                   Loopback :

             STATUS:
                   Unit Type:   DS3MUX
                               +---------+
                               |         |
            ----------------->|-------->|----------------->
                               |         |
              NETWORK DS3      |         |       DEMUX
                               |         |
            <-----------------|<--------|<-----------------
                               |fac  term|
                               +---------+


                     Press CONTROL-A For Assistance
```

6665-C

Note: Do not perform a DS3 loopback when the Soneplex Broadband chassis is connected to a DS3 CAM unit in the Soneplex CCAS system.

Figure 541-3. High Speed (DS3 MUX) Loopback Status/Commands Screen

HLXC LOOPBACK SELECTION FIELD

HRX LOOPBACK SELECTION FIELD

HLXR LOOPBACK SELECTION FIELD

```
                      Low Speed Loopback Status/Commands

                          Group: 1          DS1#: 4

Unit Location -   LOCAL               REPEATER                REMOTE
                ===========          ===========           ===========
COMMANDS:
     Loopback:


STATUS:
    Unit Type:    HLXC                 HRX1                  HLXR
                +---------+          +---------+           +---------+
                |         |          |         |           |         |
-------------->|-------->|-------->|-------->|-------->|-------->|------------->
     NETWORK    |         |          |         |           |         |  CUSTOMER
       DS1      |         |   HDSL   |         |   HDSL    |         |    DS1
                |         |          |         |           |         |
<--------------|<--------|<--------|<--------|<--------|<--------|<-------------
                |net  cust|          |net  cust|           |net  cust|
                +---------+          +---------+           +---------+

              Programmable Loopback Armed State: ARMING DISABLED

                        Press CONTROL-A For Assistance
```

11379-A

Figure 541-4. Low Speed Loopback Status/Commands Screen

Table 541-1. Loopback Selection Field Options

FIELD	UNIT TYPE	LOOPBACK TYPE	OPTION	SHOWN IN...
DS3 MUX (HIGH SPEED)				
Local	DS3 MUX	Network Loopback at the DS3 MUX	ACT NET	Figure 541-5
HDSL SYSTEMS (LOW SPEED)				
Local	HLXC	Customer Loopback at the HLXC	ACT CUST	Figure 541-6a
		Network Loopback at the HLXC	ACT NET	Figure 541-6b
Local	HLXC	Send Loopback at the HLXC Module	SEND LPBK*	Figure 541-6c
Remote	HLXR	Customer Loopback at the HLXR	ACT CUST	Figure 541-7a
		Network Loopback at the HLXR	ACT NET	Figure 541-7b
HDSL SYSTEM WITH ONE HRX (LOW SPEED)				
Repeater	HRX1	Customer Loopback at the HRX	ACT CUST	Figure 541-8a
		Network Loopback at the HRX	ACT NET	Figure 541-8b
HDSL SYSTEM WITH TWO HRXS (LOW SPEED)				
Repeater 1	HRX1	Customer Loopback at the HRX1	ACT CUST	Figure 541-9a
		Network Loopback at the HRX1	ACT NET	Figure 541-9b
Repeater 2	HRX2	Customer Loopback at the HRX2	ACT CUST	not shown
		Network Loopback at the HRX2	ACT NET	not shown
FIBER OPTIC SYSTEM WITH ODS2 AND QLX MODULES (LOW SPEED)				
Local	ODS2	Customer Loopback at the ODS2 Module	ACT CUST	Figure 541-10a
Remote	QLX	Network Loopback at the Remote QLX	ACT NET	Figure 541-10b
Local	ODS2	Send Loopback at the ODS2 Module	SEND LPBK*	Figure 541-10c
T1 SYSTEM WITH DLX MODULE (LOW SPEED)				
Local	DLX	Customer Loopback at the DLX	ACT CUST	Figure 541-11a
		Network Loopback at the DLX	ACT NET	Figure 541-11b
Local	DLX	Send Loopback at the DLX Module	SEND LPBK*	Figure 541-11c
T1 SYSTEM WITH RLX MODULE (LOW SPEED)				
Local	RLX	Customer Loopback at the RLX	ACT CUST	Figure 541-12a
		Network Loopback at the RLX	ACT NET	Figure 541-12b
Local	RLX	Send Loopback at the RLX Module	SEND LPBK*	Figure 541-12c

* The SEND LPBK option is only available in the Soneplex Broadband System at the Local command toggle field on the Loopback Status/Commands screen when the DS1 Loopback Mode field on the DS3 MUX Configuration screen is configured as C-Bit parity.

Note: When a customer (CPE) loopback is in progress, the network output signal is returned to the network as a keep-alive for network equipment. However, when a network loopback is in progress, an unframed all 1s signal (AIS) is transmitted to the customer interface.

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```
                  High Speed Loopback Status/Commands


          Unit Location -      LOCAL
                             ===========
         COMMANDS:
                 Loopback :   ACT NET

           STATUS:
                 Unit Type:   DS3MUX
                             +---------+
                             |         |
          ----------------->|----+    |----------------->
                             |    |    |
            NETWORK DS3      |    |    |       DEMUX
                             |    |    |
          <-----------------|<---+    |<-----------------
                             |fac  term|
                             +---------+


                    Press CONTROL-A For Assistance
```

6666-C

Note: Do not perform a DS3 loopback when the Soneplex Broadband chassis is connected to a DS3 CAM unit in the Soneplex CCAS system.

Figure 541-5. DS3 MUX Network Loopback Screen

```
                    Low Speed Loopback Status/Commands

                        Group: 4           DS1#: 1


 Unit Location -  LOCAL             REPEATER            REMOTE
                ==========          ==========          ==========
 COMMANDS:
      Loopback:                        N/A

 STATUS:
     Unit Type:    HLXC                NONE                HLXR
                +---------+                             +---------+
                |         |                             |         |
 -------------->|--+   +->|---------------------------->|---------|------------->
      NETWORK   |  |   |  |                             |         |  CUSTOMER
        DS1     |  |   |  |            HDSL             |         |    DS1
                |  |   |  |                             |         |
 <--------------|<-+   +--|<----------------------------|<--------|<-------------
                |net  cust|                             |net  cust|
                +---------+                             +---------+

            Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

11381-A

Figure 541-6a. HLXC Customer Loopback Screen

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```
                     Low Speed Loopback Status/Commands

                         Group: 4            DS1#: 1


Unit Location -  LOCAL              REPEATER             REMOTE
               ==========          ==========          ==========
COMMANDS:
     Loopback:                        N/A

STATUS:
    Unit Type:    HLXC                NONE                 HLXR
               +----------+                            +----------+
               |          |AIS                         |          |
-------------->|--+    +->|--------------------------->|----------|------------->
     NETWORK   |  |       |                            |          |  CUSTOMER
       DS1     |  |       |           HDSL             |          |    DS1
               |  |       |                            |          |
<--------------|<-+    +--|<---------------------------|<---------|<-------------
               |net  cust|                             |net  cust|
               +----------+                            +----------+

            Programmable Loopback Armed State: ARMING DISABLED
                       Press CONTROL-A For Assistance
```

11382-A

Figure 541-6b. HLXC Network Loopback Screen

```
                      Low Speed Loopback Status/Commands

                         Group: 1         DS1#: 4

Location -  LOCAL         REPEATER1        REPEATER2         REMOTE
         ==========       ==========       ==========       ==========
COMMANDS:
Loopback:

STATUS:
Unit Type:  HLXC            HRX1             HRX2             HLXR
         +---------+      +---------+      +---------+      +---------+
LPBK RQ> |         |      |         |      |         |      |         |AIS
-------->|-------->|------>|--------|------>|-------->|------>|--+  +->|----->
 NETWORK |         |      |         |      |         |      |  |      | CUST
   DS1   |         | HDSL |         | HDSL |         | HDSL |  |      | DS1
         |         |      |         |      |         |      |  |      |
<--------|<--------|<------|<-------|<------|<--------|<------|--+-----|<-----
<LPBK RQ |net cust|       |net cust|       |net cust|       |net cust|
         +---------+      +---------+      +---------+      +---------+

               Programmable Loopback Armed State: UNARMED
                       Press CONTROL-A For Assistance
```

11406-A

Note: The SEND LPBK command can be executed with 0, 1, or 2 HRXs.

Figure 541-6c. HLXC Send Loopback Screen

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```
                      Low Speed Loopback Status/Commands

                          Group: 4            DS1#: 1


Unit Location -  LOCAL              REPEATER             REMOTE
               ==========          ==========          ==========
COMMANDS:                             N/A
     Loopback:

STATUS:
    Unit Type:    HLXC                NONE                HLXR
               +---------+                             +---------+
               |         |                             |         |
-------------->|-------->|---------------------------->|--+   +->|------------->
     NETWORK   |         |                             |  |   |  |  CUSTOMER
       DS1     |         |            HDSL             |  |   |  |    DS1
               |         |                             |  |   |  |
<--------------|<--------|<----------------------------|<-+   +--|<-------------
               |net  cust|                             |net  cust|
               +---------+                             +---------+

              Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

11383-A

Figure 541-7a. HLXR Customer Loopback Screen

```
                      Low Speed Loopback Status/Commands

                          Group: 6            DS1#: 1


Unit Location -  LOCAL              REPEATER             REMOTE
               ==========          ==========          ==========
COMMANDS:
     Loopback:                        N/A

STATUS:
    Unit Type:    HLXC                NONE                HLXR
               +---------+                             +---------+
               |         |                             |         |AIS
-------------->|-------->|---------------------------->|--+   +->|------------->
     NETWORK   |         |                             |  |   |  |  CUSTOMER
       DS1     |         |            HDSL             |  |   |  |    DS1
               |         |                             |  |   |  |
<--------------|<--------|<----------------------------|<-+   +--|<-------------
               |net  cust|                             |net  cust|
               +---------+                             +---------+

              Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

9491-D

Figure 541-7b. HLXR Network Loopback Screen

```
                      Low Speed Loopback Status/Commands

                          Group: 4            DS1#: 1


Unit Location -  LOCAL              REPEATER             REMOTE
               ==========          ==========          ==========
COMMANDS:
     Loopback:

STATUS:
    Unit Type:    HLXC                HRX                HLXR
               +---------+         +---------+         +---------+
               |         |         |         |         |         |
-------------->|-------->|-------->|--+   +->|-------->|---------|------------->
     NETWORK   |         |         |  |   |  |         |         |  CUSTOMER
       DS1     |         |  HDSL   |  |   |  |  HDSL   |         |    DS1
               |         |         |  |   |  |         |         |
<--------------|<--------|<--------|<-+   +--|<--------|<--------|<-------------
               |net  cust|         |net  cust|         |net  cust|
               +---------+         +---------+         +---------+

            Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

9499-D

Figure 541-8a. HRX Customer Loopback Screen (One HRX)

```
                      Low Speed Loopback Status/Commands

                          Group: 4            DS1#: 1


Unit Location -  LOCAL              REPEATER             REMOTE
               ==========          ==========          ==========
COMMANDS:
     Loopback:

STATUS:
    Unit Type:    HLXC                HRX                HLXR
               +---------+         +---------+         +---------+
               |         |         |         |AIS      |         |
-------------->|-------->|-------->|--+   +->|-------->|---------|------------->
     NETWORK   |         |         |  |      |         |         |  CUSTOMER
       DS1     |         |  HDSL   |  |      |  HDSL   |         |    DS1
               |         |         |  |      |         |         |
<--------------|<--------|<--------|<-+   +--|<--------|<--------|<-------------
               |net  cust|         |net  cust|         |net  cust|
               +---------+         +---------+         +---------+

            Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

9500-C

Figure 541-8b. HRX Network Loopback Screen (One HRX)

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```
                          Low Speed Loopback Status/Commands

                              Group: 1        DS1#: 4

Location -  LOCAL              REPEATER1       REPEATER2         REMOTE
         ==========           ==========      ==========        ==========
COMMANDS:
Loopback:

STATUS:
Unit Type:    HLXC              HRX1             HRX2             HLXR
           +---------+       +---------+       +---------+       +---------+
           |         |       |         |       |         |       |         |
  -------->|-------->|------>|--+   +->|------>|---------|------>|-------->|----->
   NETWORK |         |       |  |   |  |       |         |       |         | CUST
     DS1   |         | HDSL  |  |   |  | HDSL  |         | HDSL  |         | DS1
           |         |       |  |   |  |       |         |       |         |
  <--------|<--------|<------|<-+   +--|<------|<--------|<------|<--------|<-----
           |net cust|        |net cust|        |net cust|        |net cust|
           +---------+       +---------+       +---------+       +---------+

               Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

11384-A

Figure 541-9a. HRX1 Customer Loopback Screen (Two HRXs)

```
                          Low Speed Loopback Status/Commands

                              Group: 1        DS1#: 4

Location -  LOCAL              REPEATER1       REPEATER2         REMOTE
         ==========           ==========      ==========        ==========
COMMANDS:
Loopback:

STATUS:
Unit Type:    HLXC              HRX1             HRX2             HLXR
           +---------+       +---------+       +---------+       +---------+
           |         |       |      AIS|       |         |       |         |
  -------->|-------->|------>|--+   +->|------>|---------|------>|-------->|----->
   NETWORK |         |       |  |      |       |         |       |         | CUST
     DS1   |         | HDSL  |  |      | HDSL  |         | HDSL  |         | DS1
           |         |       |  |      |       |         |       |         |
  <--------|<--------|<------|<-+   +--|<------|<--------|<------|<--------|<-----
           |net cust|        |net cust|        |net cust|        |net cust|
           +---------+       +---------+       +---------+       +---------+

               Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

11380-A

Figure 541-9b. HRX1 Network Loopback Screen (Two HRXs)

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```
                       Low Speed Loopback Status/Commands

                          Group: 2           DS1#: 1

Unit Location -     LOCAL            REPEATER           REMOTE
                   ========          =========          ========

COMMANDS:
    Loopback:                           N/A

STATUS:
    Unit Type:     ODS2                 NONE                QLX
                  +---------+                            +---------+
                  |         |                            |         |
---------------> |--+  +-> |-------------------------> |-------->|--------------->
    NETWORK       |     |   |                            |         |   CUSTOMER
      DS1         |     |   |                            |         |     DS1
                  |     |   |                            |         |
<--------------- |<-+  +-- |<------------------------- |<--------|<---------------
                  |net cust |                            |net  cust|
                  +---------+                            +---------+


                       Press CONTROL-A For Assistance
```

9698-A

Figure 541-10a. ODS2 Customer Loopback

```
                      Low Speed Loopback Status/Commands

                         Group: 2           DS1#: 1


Unit Location -  LOCAL             REPEATER            REMOTE
               ==========          ==========          ==========
COMMANDS:
    Loopback:                          N/A

STATUS:
   Unit Type:    ODS2                 NONE                QLX
               +---------+                            +---------+
               |         |                            |         | AIS
-------------->|-------->|--------------------------->|--+   +->|------------->
   NETWORK     |         |                            |  |      |  CUSTOMER
     DS1       |         |        OPTICAL DS2         |  |      |    DS1
               |         |                            |  |      |
<--------------|<--------|<---------------------------|<-+   +--|<-------------
               |net  cust|                            |net  cust|
               +---------+                            +---------+


                      Press CONTROL-A For Assistance
```

9496-C

Figure 541-10b. Remote QLX Network Loopback Screen

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```
                        Low Speed Loopback Status/Commands

                           Group: 2            DS1#: 1

Unit Location -     LOCAL            REPEATER           REMOTE
                  ========          =========          ========

COMMANDS:
    Loopback:                          N/A

STATUS:
    Unit Type:      ODS2               NONE               QLX
                 +----------+                        +----------+
LPBK RQ>         |          |                        |          |
---------------->|--------->|------------------------>|--------->|--------------->
    NETWORK      |          |                        |          |   CUSTOMER
      DS1        |          |       OPTICAL DS2      |          |     DS1
                 |          |                        |          |
<----------------|<---------|<-----------------------|<---------|<---------------
<LPBK RQ         |net  cust|                         |net  cust|
                 +----------+                        +----------+

                          Press CONTROL-A For Assistance
```

14849-A

Figure 541-10c. ODS2 SEND LPBK Screen

```
                        Low Speed Loopback Status/Commands

                           Group: 5           DS1#: 1

Unit Location -     LOCAL            REPEATER          REMOTE
                  ========          =========         ========

COMMANDS:
    Loopback:                          N/A

STATUS:
    Unit Type:      DLX                NONE              NONE
                 +----------+
                 |          |
---------------> |--+   +-> |---------------------------------------------------->
    NETWORK      |      |   |                                         CUSTOMER
      DS1        |      |   |                                           DS1
                 |      |   |
<--------------- | <----+-- |<----------------------------------------------------
                 |net  cust |
                 +----------+

                          Press CONTROL-A For Assistance
```

9699-A

Figure 541-11a. DLX Customer Loopback Screen

```
                    Low Speed Loopback Status/Commands

                       Group: 5           DS1#: 1

Unit Location -     LOCAL            REPEATER          REMOTE
                  ========          =========         ========

COMMANDS:
    Loopback:                          N/A               N/A

STATUS:
    Unit Type:     DLX                NONE              NONE
                 +---------+
                 |         |AIS
---------------> |--+  +-> |---------------------------------------------------->
   NETWORK       |  |      |                                        CUSTOMER
     DS1         |  |      |                                          DS1
                 |  |      |
<--------------- | <-+  +--|<---------------------------------------------------
                 |net  cust|
                 +---------+


                    Press CONTROL-A For Assistance
```

9700-A

Figure 541-11b. DLX Network Loopback Screen

```
                    Low Speed Loopback Status/Commands

                       Group: 7           DS1#: 3

Unit Location -     LOCAL            REPEATER          REMOTE
                  ========          =========         ========

COMMANDS:
    Loopback:                          N/A               N/A

STATUS:
    Unit Type:      DLX               NONE              NONE
                 +---------+
LPBK RQ>         |         |AIS
---------------->|--+   +->|----------------------------------------------------->
   NETWORK       |  |      |                                        CUSTOMER
     DS1         |  |      |                                          DS1
                 |  |      |
<----------------|<-+   +--|<----------------------------------------------------
<LPBK RQ         |net  cust|
                 +---------+

                    Press CONTROL-A For Assistance
```

14848-A

Figure 541-11c. DLX SEND LPBK Screen

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```
                          Low Speed Loopback Status/Commands

                              Group: 1           DS1#: 1


Unit Location -  LOCAL              REPEATER            REMOTE
               ==========          ==========          ==========
COMMANDS:
     Loopback:                       N/A                 N/A

STATUS:
    Unit Type:    RLX                NONE                NONE
               +---------+
               |         |
-------------->|--+   +->|----------------------------------------------------->
     NETWORK   |      |  |                                              CUSTOMER
       DS1     |      |  |                                                DS1
          AIS  |      |  |
<--------------|<-+   +--|<-----------------------------------------------------
               |net  cust|
               +---------+

       Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

9493-C

Figure 541-12a. RLX Customer Loopback Screen

```
                          Low Speed Loopback Status/Commands

                              Group: 1           DS1#: 1


Unit Location -  LOCAL              REPEATER            REMOTE
               ==========          ==========          ==========
COMMANDS:
     Loopback:                       N/A                 N/A

STATUS:
    Unit Type:    RLX                NONE                NONE
               +---------+
               |         | AIS
-------------->|--+  +-->|----------------------------------------------------->
     NETWORK   |  |      |                                              CUSTOMER
       DS1     |  |      |                                                DS1
               |  |      |
<--------------|<-+  +---|<-----------------------------------------------------
               |net  cust|
               +---------+

             Programmable Loopback Armed State: ARMING DISABLED
                        Press CONTROL-A For Assistance
```

9494-B

Figure 541-12b. RLX Network Loopback Screen

```
                         Low Speed Loopback Status/Commands

                            Group: 5            DS1#: 1

Unit Location -     LOCAL            REPEATER           REMOTE
                  ========          =========          ========

COMMANDS:
    Loopback:                          N/A                N/A

STATUS:
    Unit Type:       RLX               NONE               NONE
                 +---------+
LPBK RQ>         |         |AIS
---------------->|--+   +->|---------------------------------------------------->
    NETWORK      |  |      |                                       CUSTOMER
      DS1        |  |      |                                         DS1
                 |  |      |
<----------------|<-+   +--|<----------------------------------------------------
<LPBK RQ         |net  cust|
                 +---------+

                Programmable Loopback Armed State: ARMING DISABLED
                          Press CONTROL-A For Assistance
```

14850-A

Figure 541-12c. RLX SEND LPBK Screen

ACTIVE ALARMS DISPLAY

Summary: This procedure provides instructions for displaying only the currently active alarms for all circuits in the system.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

➧ **Note:** Pressing the “R” key clears the screen and displays only the current alarm status.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Display Active Alarms from the Alarms menu. Press Enter or Return. A Display Active Alarms screen is shown in Figure 542-1.

3. A maximum of 112 entries is displayed. If the list is too long to fit on one screen, use the Up/Down keys to scroll through the entries one line at a time. Use the right arrow key to move down one screen at a time. Use the left arrow key to move up one screen at a time. Pressing CONTROL-R queries the database for all currently active alarms and a new list is displayed.

   The first column (**Access Identifier**) (AID) identifies an entity in the Soneplex Broadband system to which the alarm condition pertains. Different alarm conditions in the Soneplex Broadband system result in different types of AIDs.

   The second column (**Locn**) displays NEND, FEND, REPC, or REPR indicating the location of the alarm. Figure 542-2 (T1 HLXC/HRX/HLXR NEND and FEND locations), Figure 542-3 (HDSL HLXC/HRX/HLXR NEND and FEND Locations), Figure 542-4 (DLX NEND locations), Figure 542-5, (ODS2 NEND locations), and Figure 542-6 (RLX NEND and FEND Locations) show FEND, NEND, REPC, and REPR locations and descriptions for HLXC/HRX/HLXR, DLX, ODS2, and RLX systems.

   The third column (**Circuit Identifier**) displays the circuit or facility name assigned in the configuration menu. This is also the circuit in trouble.

   The fourth column (**Condition**) displays the alarm condition present on the circuit.

   Reference: TAP-101 Alarm Troubleshooting

   The fifth column (**Status**) displays CR (Critical), MJ (Major), MN (Minor), or EV (Event), indicating the degree of the alarm.

   The sixth column (**ACO**) indicates whether the Alarm Cut-Off has been activated (YES or NO) for a given alarm.

Stop! You have completed this procedure.

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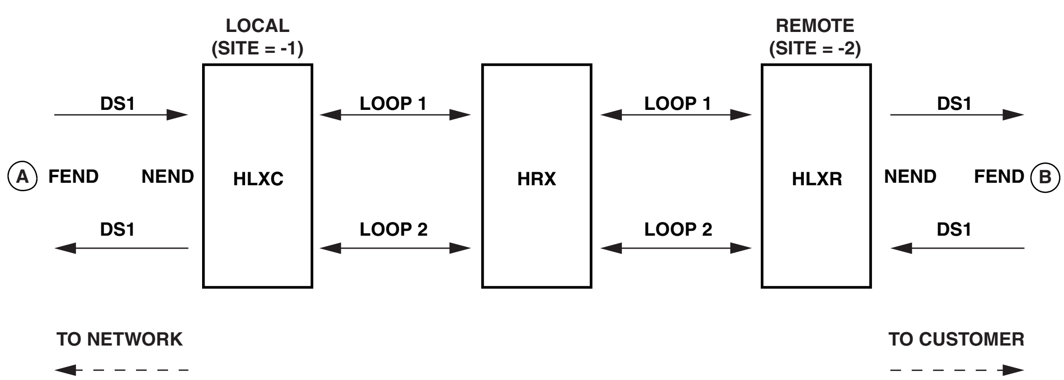
```
                                ACTIVE ALARMS
Legend:
Access ID=Identifier[-]Shelf-Grp-Slot[-Site(1=Lcl,2=Rmt) | -Loop(1=Lp 1,2=Lp 2)]

  Access ID         Locn  Circuit ID            Condition         Status  ACO
  ----------------  ----  --------------------  ----------------  ------  ---
  T2-1-3-1          NEND                        OPTICAL LOS         MJ    NO
  T2-1-3-1          NEND                        OPTICAL LOF         MJ    NO
  HDSL-1-7-1-1      NEND                        RECOVERY            MN    NO
  HDSL-1-7-1-1      NEND                        LOF                 MJ    NO
  HDSL-1-7-1-1      NEND                        T-BERP              MN    NO
  HDSL-1-7-1-1      NEND                        T-SNR               EV    NO
  HDSL-1-7-1-1      FEND                        LOF                 MJ    NO
  HDSL-1-7-1-1      FEND                        T-BERP              MN    NO
  HDSL-1-7-1-1      FEND                        T-SNR               EV    NO
  HDSL-1-7-1-2      NEND                        RECOVERY            MN    NO
  HDSL-1-7-1-2      NEND                        LOF                 MJ    NO
  HDSL-1-7-1-2      NEND                        T-BERP              MN    NO
  HDSL-1-7-1-2      NEND                        T-SNR               EV    NO
  HDSL-1-7-1-2      FEND                        LOF                 MJ    NO
  HDSL-1-7-1-2      FEND                        T-BERP              MN    NO
  HDSL-1-7-1-2      FEND                        T-SNR               EV    NO

Page  1 of  1            Press CONTROL-A for assistance
```

6675-A

Figure 542-1. Active Alarms Screen (Sample)



KEY
NEND means "PM information collected directly from incoming T1 signals, both at local and remote sites."
FEND means "ESF PRM information collected at the opposite ends of spans from the affected circuit and returned to the system via the ESF Datalink, both at local and remote sites". The framing format must be ESF in order for FEND information to be displayed.
Note: For Site 1, FEND information is at A; for Site 2, FEND information is at B.

10263-A

Figure 542-2. T1 HLXC/HRX/HLXR NEND and FEND Locations

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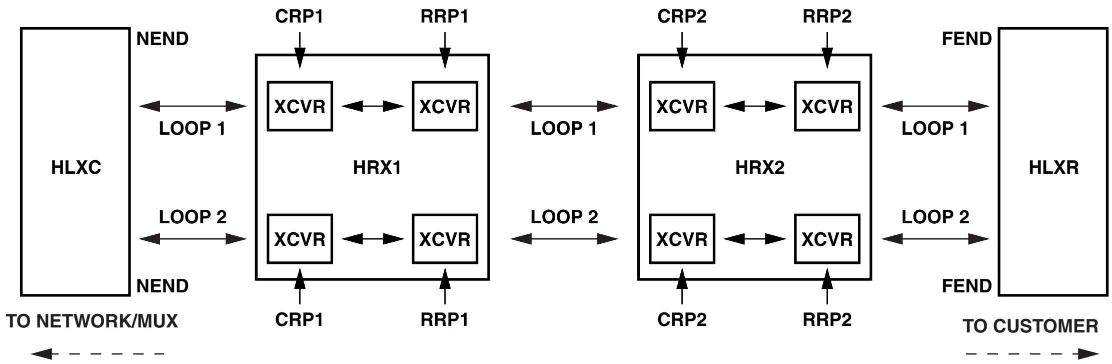


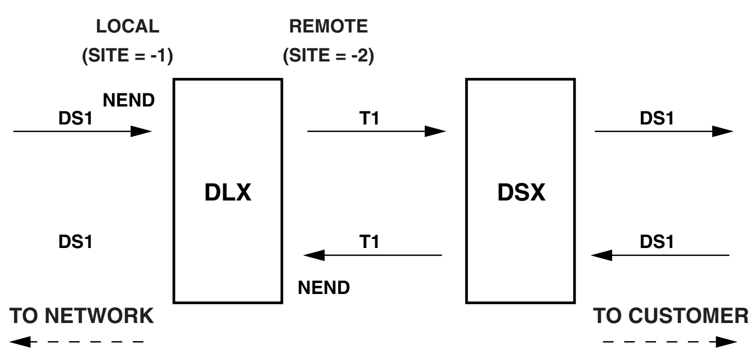
KEY
NEND means "at the HLXC, looking toward the customer (HLXR)."
FEND means "at the HLXR, looking toward the network (HLXC)."
CRP1 means "at the central office side of the HRX1, looking toward the network (HLXC)."
RRP1 means "at the remote (CPE) side of the HRX1, looking toward the customer (HRX2/HLXR)."
CRP2 means "at the central office side of the HRX2, looking toward the network (HRX1/HLXC)."
RRP2 means "at the remote (CPE) side of the HRX2, looking toward the customer (HLXR)."

CRP1 (Alarm History, PM Reports, and Status screens) = LINE 1 (TL1)
RRP1 (Alarm History, PM Reports, and Status screens) = LINE 2 (TL1)
CRP2 (Alarm History, PM Reports, and Status screens) = LINE 3 (TL1)
RRP2 (Alarm History, PM Reports, and Status screens) = LINE 4 (TL1)

NOTE: CRP2 and RRP2 are not present when there is no HRX2.

11375-B

Figure 542-3. HDSL HLXC/HRX/HLXR NEND and FEND Locations



KEY
NEND means "PM information collected directly from incoming T1 signals, both at local and remote sites".

10455-A

Figure 542-4. DLX NEND Locations

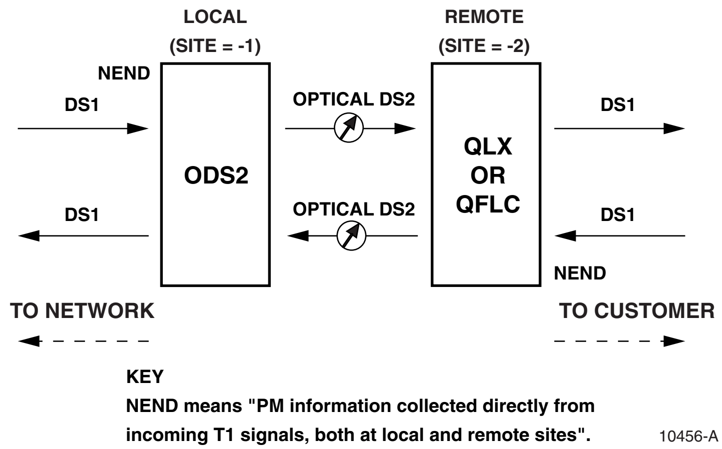


Figure 542-5. ODS2 NEND Locations

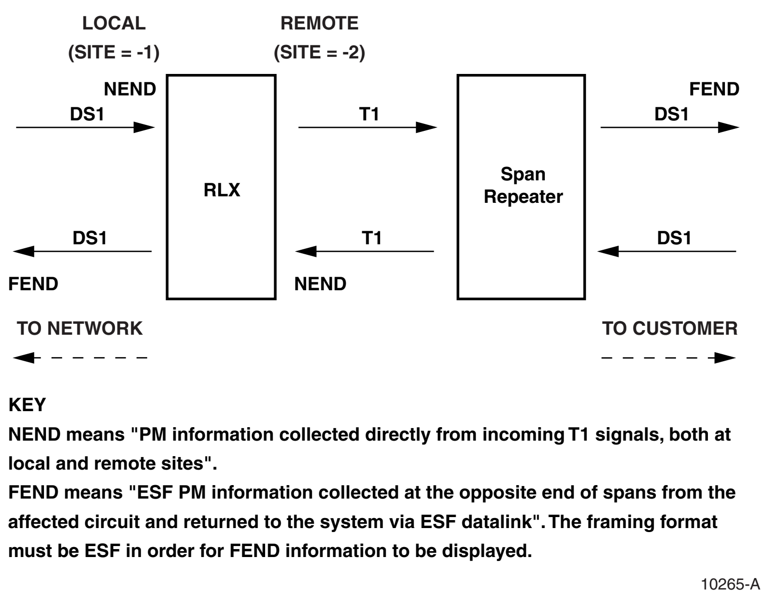


Figure 542-6. RLX NEND and FEND Locations

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ALARM SUMMARY DISPLAY

Summary: Use this command to display a summary of the current alarms for the Soneplex Broadband chassis selected.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

➧ **Note:** Pressing the "R" key clears the screen and displays only the current alarm status.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Display Alarm Summary from the Alarms menu. Press Enter or Return. A Display Alarm Summary screen is shown in Figure 543-1.

➧ **Note:** Each time the shelf status changes, the screen is updated. When the screen is full, the oldest status line scrolls off the screen.

Stop! You have completed this procedure.

```
                                  ALARM SUMMARY

                                     Legend:
                                    ---------
- No Alarm     L=Local Equipment     R=Remote Equipment/Facility     H=Housekeeping
* Alarm(s)     F=Local Facility      M=Multiple

                   Shelf                 Mux   Low Speed Units (Group-Slot)
                   =============         ===   ==================================
                         H R P A         M M    1-   2-   3-   4-   5-   6-   7-
                   C M M S E W C         X X   ---- ---- ---- ---- ---- ---- ----
Date      Time     R J N K M R O         W P   1234 1234 1234 1234 1234 1234 1234
======== ========  = = = = = = =         = =   ==== ==== ==== ==== ==== ==== ====
01/04/95 04:29:23  - * - - - * *               L               -    -




                          Press CONTROL-A For Assistance
```

6676-B

Figure 543-1. Alarm Summary Screen (Typical)

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ALARM HISTORY DISPLAY

Summary: This procedure provides instructions for displaying both active and cleared alarms stored in the alarm history. Each alarm declaration or alarm clearing creates a separate message in the history buffer. (However, Event level alarms do not show a clearing message.)

Note: Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select Display Alarm History from the Alarms menu. Press Enter or Return. An Alarm History screen is shown in Figure 544-1.

2. At the selection prompt Press Enter or Return. Both the active and cleared alarms appear as shown in Figure 544-1.

3. Up to a maximum of 112 messages can be displayed from this history buffer. The messages are displayed in reverse chronological order, starting with the most recent. If the list is too long to fit on one screen, use the up/down keys to scroll through the entries one line at a time. Use the right arrow key to move down one screen at a time. Use the left arrow key to move up one screen at a time. Press CONTROL-R to refresh screen and poll the system for the 112 most current alarm occurrences.

   The first (**Date**) and second (**Time**) columns on the screen display the date and time respectively of the alarms stored in the history file.

   The third column (**Access ID**) identifies an entity in the Soneplex Broadband system to which the alarm condition pertains. Different alarm conditions result in different types of AIDs.

   Reference: TAD-106 Access Identifier

   The fourth column (**Locn**) displays NEND, FEND, REPC, or REPR indicating the location of the alarm. Figure 544-2 (T1 HLXC/HRX/HLXR NEND and FEND locations), Figure 544-3 (HDSL HLXC/HRX/HLXR NEND and FEND Locations), Figure 544-4 (DLX NEND locations), Figure 544-5, (ODS2 NEND locations), and Figure 544-6 (RLX NEND and FEND Locations) show FEND, NEND, REPC, and REPR locations and descriptions for HLXC/HRX/HLXR, DLX, ODS2, and RLX systems.

   The sixth column (**Circuit Identifier**) displays the circuit or facility name assigned in the configuration menu.

   The seventh column (**Condition**) displays the alarm condition present on the circuit.

   Reference: TAP-101 Alarm Troubleshooting

   The eighth column (**St** or Status) displays CR (critical alarm), MJ (major alarm), MN (minor alarm), EV (event), or CL (alarm has cleared).

Stop! You have completed this procedure.

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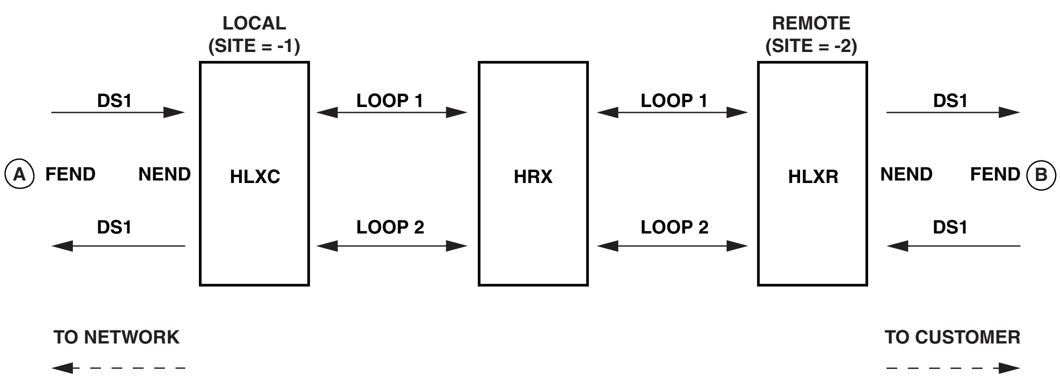
```
                                   ALARM HISTORY
Legend:
Access ID=Identifier[-]Shelf-Grp-Slot[-Site(1=Lcl,2=Rmt) | -Loop(1=Lp 1,2=Lp 2)]

Date     Time     Access ID        Locn Circuit ID           Condition        St
-------- -------- ---------------- ---- -------------------- ---------------- --
01/03/95 22:37:00 HDSL-1-6-1-2     FEND                      LOF              CL
01/03/95 22:37:00 HDSL-1-6-1-1     FEND                      LOF              CL
01/03/95 22:36:57 HDSL-1-6-1-2     NEND                      LOF              CL
01/03/95 22:36:57 HDSL-1-6-1-1     NEND                      LOF              CL
01/03/95 22:36:52 HDSL-1-6-1-2     FEND                      LOF              MJ
01/03/95 22:36:52 HDSL-1-6-1-1     FEND                      LOF              MJ
01/03/95 22:36:48 HDSL-1-6-1-2     FEND                      LOF              CL
01/03/95 22:36:48 HDSL-1-6-1-2     NEND                      RECOVERY         CL
01/03/95 22:36:48 HDSL-1-6-1-1     FEND                      LOF              CL
01/03/95 22:36:48 HDSL-1-6-1-1     NEND                      RECOVERY         CL
01/03/95 22:36:36 HDSL-1-6-1-2     NEND                      RECOVERY         MN
01/03/95 22:36:36 HDSL-1-6-1-1     NEND                      RECOVERY         MN
01/03/95 22:36:34 HDSL-1-6-1-2     NEND                      RECOVERY         CL
01/03/95 22:36:34 HDSL-1-6-1-1     NEND                      RECOVERY         CL
01/03/95 22:36:32 HDSL-1-6-1-1     NEND                      DC CONTINUITY    CL
01/03/95 22:36:25 HDSL-1-6-1-2     NEND                      RECOVERY         MN
01/03/95 22:36:25 HDSL-1-6-1-1     NEND                      RECOVERY         MN
Page  1 of  2           Press CONTROL-A for assistance
```

6677-A

Figure 544-1. Alarm History Screen (Typical)

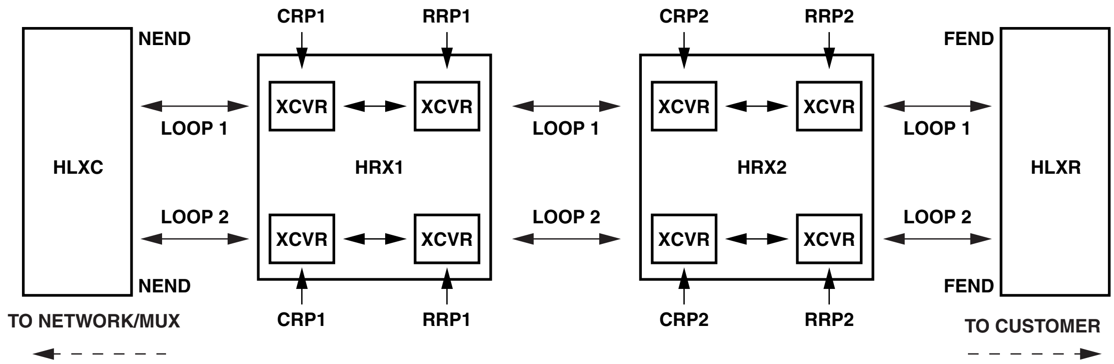


KEY

NEND means "PM information collected directly from incoming T1 signals, both at local and remote sites."
FEND means "ESF PRM information collected at the opposite ends of spans from the affected circuit and returned to the system via the ESF Datalink, both at local and remote sites". The framing format must be ESF in order for FEND information to be displayed.
Note: For Site 1, FEND information is at A; for Site 2, FEND information is at B.

10263-A

Figure 544-2. T1 NEND and FEND Locations



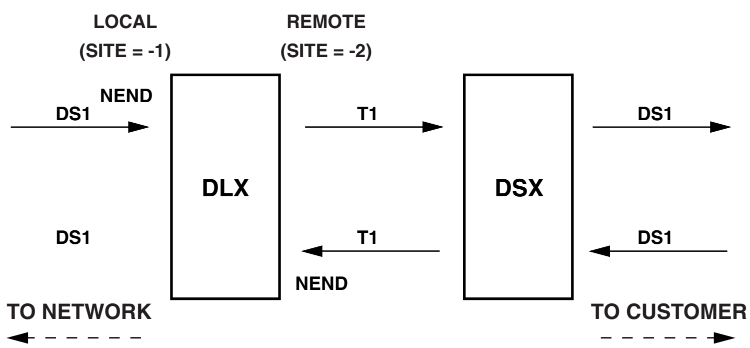
KEY
NEND means "at the HLXC, looking toward the customer (HLXR)."
FEND means "at the HLXR, looking toward the network (HLXC)."
CRP1 means "at the central office side of the HRX1, looking toward the network (HLXC)."
RRP1 means "at the remote (CPE) side of the HRX1, looking toward the customer (HRX2/HLXR)."
CRP2 means "at the central office side of the HRX2, looking toward the network (HRX1/HLXC)."
RRP2 means "at the remote (CPE) side of the HRX2, looking toward the customer (HLXR)."

CRP1 (Alarm History, PM Reports, and Status screens) = LINE 1 (TL1)
RRP1 (Alarm History, PM Reports, and Status screens) = LINE 2 (TL1)
CRP2 (Alarm History, PM Reports, and Status screens) = LINE 3 (TL1)
RRP2 (Alarm History, PM Reports, and Status screens) = LINE 4 (TL1)

NOTE: CRP2 and RRP2 are not present when there is no HRX2.

11375-B

Figure 544-3. HDSL NEND and FEND Locations



KEY
NEND means "PM information collected directly from incoming T1 signals, both at local and remote sites".

10455-A

Figure 544-4. DLX NEND Locations

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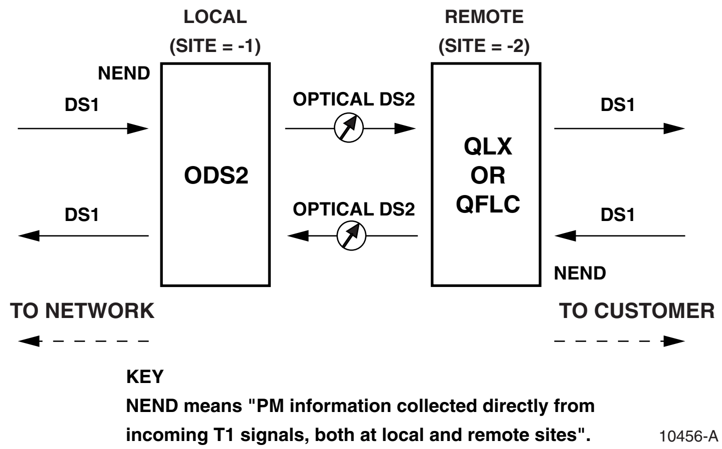

Figure 544-5. ODS2 NEND Locations

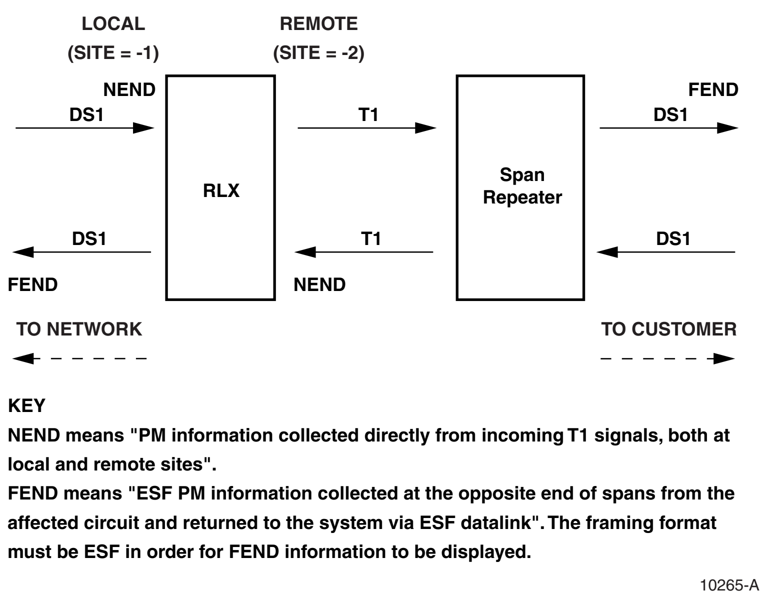

Figure 544-6. RLX NEND and FEND Locations

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SHELF STATUS DISPLAY

Summary: This procedure provides instructions for viewing the status of all the modules installed in the selected Soneplex Broadband chassis.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select Display Status from the Main Menu. Press Enter or Return.
2. Use the arrow keys to select Display Shelf Status from the Display Status menu. Press Enter or Return. A Shelf Status screen is shown in Figure 545-1. Refer to Figure 545-2 for a help screen that displays a key to the Shelf Status screen.

Stop! You have completed this procedure.

```
                                  SHELF STATUS

                                     Low Speed Units (Group-Slot)
Critical               =======================================================
Shelf           T M M    1 -     2 -     3 -     4 -     5 -     6 -     7 -
Alarm:          A X X  ------- ------- ------- ------- ------- ------- -------
                U W P  1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4
                = ===  ======= ======= ======= ======= ======= ======= =======
Unit Type    :  R + +  R               O   O           D        H       H
Unit Present:   * * *  *               *   *           *       *       *
Equip State :   E E P  E               U   E           E       E       U
Online       :    *
Alarm(s)     :
In Service   :    *

Facility          ===  ======= ======= ======= ======= ======= ======= =======
In Service   :

                  1 2 3 4 5 6 7 8
                  ===============
HSKP Alarm(s):


                         Press CONTROL-A For Assistance
```

14870-A

Note: A '*' in the 'Unit Present' field means that module is present

Figure 545-1. Shelf Status Screen (Typical)

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```
       HELP SCREEN - press any key to return to MENU

  On MENU:

     Unit Type:                 Equip State:
         M - MUX                    E - Equipped
         + - MUX-PLUS               U - Unequipped
         X - MUX-ENHANCED           P - Protected
         O - ODS2
         H - HLX
         R - RLX                 TAU Unit Type
         D - DLX                    T - TAU
         Q - QLX                    R - RTAU


     Control-P - Jump to previous menu
     Control-T - Jump to Main Menu
     Control-R - Refresh this current menu
     Control-A - Display this help screen
     Control-D - Terminate user session (logout)
```

14855-A

Figure 545-2. Help Screen

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DS3 MUX STATUS DISPLAY

Summary: This procedure provides instructions for displaying the status of the working and protect Soneplex DS3 MUX modules installed in the chassis.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select Display Status from the Main Menu. Press Enter or Return.

2. Use the arrow keys or number keys to select Display MUX Status from the Display Status menu (Figure 546-1). Press Enter or Return. A detailed Display Status screen is shown in Figure 546-2.

➧ **Note:** DS3 RX Status displays are OK, LOS, OOF, Yellow, AIS, Idle, M13, or C-Bit.

Stop! You have completed this procedure.

```
                    DISPLAY STATUS

                1. Display Shelf Status
                2. Display MUX Status
                3. Display ODS2 Status
                4. Display QLX Status
                5. Display HLX Status
                6. Display DLX Status
                7. Display RLX Status




            Press CONTROL-A For Assistance
```

9447-A

Figure 546-1. Display Status Menu

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```
                              DS3MUX STATUS


                    Working  Protect
                    -------  -------
   Unit Online       :  YES      NO
   Board Fail        :  NO       NO
   Mate Comm Fail    :  NO       NO
   RX DS3 Lpbk       :  NO       NO
   DS3 RX Status     :  OK       OK
   DS3 Framing Format:    M13
   APS Status        :    ENABLED
   APS Lockout       :    NO
   Splitter Present  :    YES
   TAU Present       :    YES

      Group :  - 1 -    - 2 -    - 3 -    - 4 -    - 5 -    - 6 -    - 7 -
      Slot  : 1 2 3 4  1 2 3 4  1 2 3 4  1 2 3 4  1 2 3 4  1 2 3 4  1 2 3 4
              =======  =======  =======  =======  =======  =======  =======
RX DS1 Lpbk : N N N N  N N N N  N N N N  N N N N  N N N N  N N N N  N N N N

                    Press CONTROL-A For Assistance
```

6679-B

Figure 546-2. DS3 MUX Status Screen

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ODS2 MODULE STATUS DISPLAY

Summary: Use this command to display the status of the working and protect Soneplex ODS2 modules installed in the selected chassis.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select Display Status from the Main Menu. Press Enter or Return.
2. Use the arrow keys to select Display ODS2 Status from the Display Status menu. Press Enter or Return. A Display ODS2 Status screen is shown in Figure 547-1.
3. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

   Reference: TAD-106 Access Identifier

Stop! You have completed this procedure.

```
                                  ODS2 STATUS
                                    Group: 3
                                       LOCAL                    REMOTE
                                 Working   Protect        Working   Protect
                                 -------   -------        -------   -------
             Unit Online Status: ONLINE
             HSKP1/HSKP2       :   N/A       N/A
             Optical Status    :   LOS
             Optical Comm Fail :   NO
             Laser Degrade     :   NO
             Mate Comm Fail    :   N/A
             Config Mismatch   :   NO
             Version Mismatch  :   NO
             Board Fail        :   NO
             Optical BER Alarm :   NO
             APS Status        :     ENABLED
             APS Lockout       :        NO

             DS1 Number        : 1 2 3 4   1 2 3 4        1 2 3 4   1 2 3 4
                                 =======   =======        =======   =======
             DS1 Online Status : Y Y Y Y
             DS1 Lpbk Active   : N N N N
             Receive DS1 LOS   : - - - -
             Receive DS1 AIS   : - - - -
```

6140-B

Figure 547-1. ODS2 Status Screen

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HLX AND HRX STATUS DISPLAY

Summary: This procedure provides instructions for displaying the status of the HLX modules installed in the central office chassis, the associated HLX modules at the remote end of the circuit, and the HRX modules.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select Display HLX Status from the Display Status menu. Press Enter or Return.

2. Use the arrow keys to select HLX Status from the Display Status menu. Press Enter or Return. Refer to Table 548-1 for descriptions of status screens, and status locations displayed on the screens.

3. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

   Reference: TAD-106 Access Identifier

4. Move to the **Slot** toggle field. Select slot number 1, 2, 3, or 4.

Stop! You have completed this procedure.

Table 548-1. Status Locations

HLXC/HLXR SYSTEM TYPE	MPU SOFTWARE VERSION	STATUS SCREEN	SCREEN FIGURE	STATUS LOCATIONS	STATUS LOCATION DESCRIPTIONS
No HRX	V5.1	HLX Status	Figure 548-1	N/A	None
One HRX	V5.1	HLX/HRX Status	Figure 548-2	C-SIDE, R-SIDE	Figure 548-4
One or two HRXs	V5.2	HLX/HRX Status	Figure 548-3	CRP1, RRP1, CRP2, RRP2	Figure 548-5

Note: If one or no HRX is present in a two-repeater system, or no HRX is present in a one-repeater system, the screens will show “N/A” in the related HRX column.

Table 548-2. HLX and HRX Status Field Displays

STATUS FIELD: MODULE	DISPLAY	DESCRIPTION
DS1 Loopback	ACTIVE, INACTIVE	A loopback is active or has been deactivated at the HLXC, HRX, or HLXR.
DS1 LOS	YES, NO	A loss of signal has occurred at the HLXC, HRX, or HLXR.
DS1 Line Code	AMI, B8ZS, AUTO, N/A	See DLP-531 for descriptions of related HLX configuration fields.
DS1 Frame Format	UNFRAMED, Ft ONLY, ESF, SF, N/A AUTO	See DLP-531 for descriptions of related HLX configuration fields.
Loop Reversal	YES, NO, N/A	A loop reversal has occurred at the HLXC, HRX, or HLXR.
HSKP1/HSKP2	YES, NO, N/A	Housekeeping alarms 1 and/or 2 have occurred at the HLXC, HRX, or HLXR.
PWR1/PWR2	YES, NO, N/A	Power alarms 1 and/or 2 have occurred at the HLXC, HRX, or HLXR.
STATUS FIELD: HDSL LOOPS	**DISPLAY**	**DESCRIPTION**
(HDSL) Start-Up IP	YES, NO, N/A	MPU5.2 software or later: no HRXs or MPU 5.1 software.
	NRM, DIS, LSW	MPU 5.2 software or later: Normal, Disabled, or Loss of Synch Word at Loop 1 or Loop 2 at the HLXC or HLXR.
Tip-Ring (T/R) Reversal	YES, NO, N/A	
SNR (Thresh) Exceeded	YES, NO, N/A	See DLP-531 for descriptions of related HLX configuration fields.
BER (Thresh) Exceeded	YES, NO, N/A	See DLP-531 for descriptions of related HLX configuration fields.
Pulse Attn (dB)	Range of +1 to +40	See DLP-531 for descriptions of related HLX configuration fields.
SNR (margin dB)	Range of –10 to +30	See DLP-531 for descriptions of related HLX configuration fields.

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```
                            HLX/HRX STATUS

                Group: 1      Slot: 2      Circuit ID:

                         HLXC          HRX1          HRX2          HLXR
                      ===========   ===========   ===========   ===========
DS1 Loopback       :    INACTIVE        N/A           N/A         INACTIVE
DS1 LOS            :      YES           N/A           N/A           YES
DS1 Line Code      :      AMI           N/A           N/A           AMI
DS1 Frame Format   :      N/A           N/A           N/A           N/A
Loop Reversal      :      N/A           N/A           N/A           NO
HSKP1/HSKP2        :      N/A           N/A           N/A           NO
PWR1/PWR2          :      N/A           N/A           N/A           NO

                   HLXC      CRP1      RRP1      CRP2      RRP2      HLXR
      HDSL       LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2
=============    ===  ===  ===  ===  ===  ===  ===  ===  ===  ===  ===  ===
HDSL LP STAT:    NRM  NRM  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A  NRM  NRM
T/R Reversal:    N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A  NO   NO
SNR Exceeded:    NO   NO   N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A  NO   NO
BER Exceeded:    NO   NO   N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A  NO   NO
Pulse Attn  :     +0   +0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A   +0   +0
SNR margin  :    +26  +26  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A  +24  +25

                       Press CONTROL-A For Assistance
```

14858-A

Note: The SNR and PA values are only updated when the HDSL loop is active. If the HDSL loop has never been activated, the SNR value will be set to 71, and the PA value will be set to 0.

Figure 548-1. HLX Status Screen (MPU V5.3 Without an HRX)

```
                            HLX/HRX STATUS

                Group: 1      Slot: 2      Circuit ID:

                         HLXC          HRX1          HRX2          HLXR
                      ===========   ===========   ===========   ===========
DS1 Loopback       :    INACTIVE     INACTIVE        N/A         INACTIVE
DS1 LOS            :      YES           N/A           N/A           YES
DS1 Line Code      :      AMI           N/A           N/A           AMI
DS1 Frame Format   :      N/A           N/A           N/A           N/A
Loop Reversal      :      N/A           NO            N/A           NO
HSKP1/HSKP2        :      N/A           N/A           N/A           NO
PWR1/PWR2          :      N/A           N/A           N/A           NO

                   HLXC      CRP1      RRP1      CRP2      RRP2      HLXR
      HDSL       LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2
=============    ===  ===  ===  ===  ===  ===  ===  ===  ===  ===  ===  ===
HDSL LP STAT:    NRM  NRM  NRM  NRM  NRM  NRM  N/A  N/A  N/A  N/A  NRM  NRM
T/R Reversal:    N/A  N/A  NO   NO   N/A  N/A  N/A  N/A  N/A  N/A  NO   NO
SNR Exceeded:    NO   NO   NO   NO   NO   NO   N/A  N/A  N/A  N/A  NO   NO
BER Exceeded:    NO   NO   NO   NO   NO   NO   N/A  N/A  N/A  N/A  NO   NO
Pulse Attn  :     +0   +0   +0   +0   +0   +0  N/A  N/A  N/A  N/A   +0   +0
SNR margin  :    +25  +25  +24  +24  +25  +25  N/A  N/A  N/A  N/A  +24  +24

                       Press CONTROL-A For Assistance
```

14857-A

Note: The SNR and PA values are only updated when the HDSL loop is active. If the HDSL loop has never been activated, the SNR value will be set to 71, and the PA value will be set to 0.
Note: Figure 548-4 provides a key to the HRX status column headings shown in this figure.

Figure 548-2. HLX/HRX Status Screen (MPU V5.3 With One HRX)

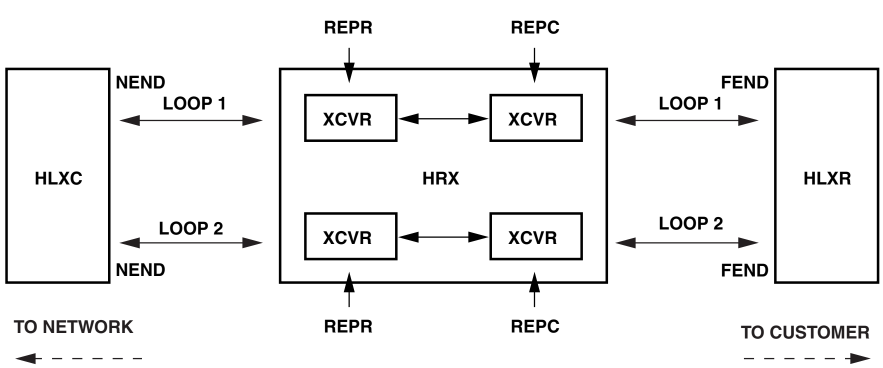
```
                         HLX/HRX STATUS

            Group: 1     Slot: 4     Circuit ID:

                       HLXC         HRX1            HRX2            HLXR
                   ===========   ===========     ===========     ===========
DS1 Loopback     :   INACTIVE     INACTIVE        INACTIVE        INACTIVE
DS1 LOS          :    YES          N/A             N/A             YES
DS1 Line Code    :   AUTO-AMI      N/A             N/A             AUTO-AMI
DS1 Frame Format:    AUTO-ESF      N/A             N/A             AUTO-ESF
Loop Reversal    :     N/A         NO              NO              YES
HSKP1/HSKP2      :     N/A         N/A             N/A             N/A
PWR1/PWR2        :     N/A         N/A             N/A             N/A

                   HLXC      CRP1      RRP1      CRP2      RRP2      HLXR
     HDSL        LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2  LP1  LP2
==============   ==== ==== ==== ==== ==== ==== ==== ==== ==== ==== ==== ====
HDSL IP STAT:    NRM  NRM  NRM  NRM  NRM  NRM  NRM  NRM  NRM  NRM  NRM  NRM
T/R Reversal:    N/A  N/A  NO   NO   N/A  N/A  NO   NO   N/A  N/A  NO   NO
SNR Exceeded:    NO   NO   NO   NO   NO   NO   NO   NO   NO   NO   NO   NO
BER Exceeded:    NO   NO   NO   NO   NO   NO   NO   NO   NO   NO   NO   NO
Pulse Attn  :     +0   +0   +0   +0   +0   +0   +0   +0   +0   +0   +0   +0
SNR margin  :    +23  +23  +23  +23  +23  +23  +23  +23  +23  +23  +24  +24

                        Press CONTROL-A For Assistance
```

11374-B

Note: The SNR and PA values are only updated when the HDSL loop is active. If the HDSL loop has never been activated, the SNR value will be set to 71, and the PA value will be set to 0.

Note: Figure 548-5 provides a key to the HRX status column headings shown in this figure.

Figure 548-3. HLX/HRX Status Screen (MPU V5.3 With Two HRXs)



KEY
NEND means "at the HLXC, looking toward the customer (HLXR)."
FEND means "at the HLXR, looking toward the network (HLXC)."
REPC means "at the HRX, looking toward the customer (HLXR)."
REPR means "at the HRX, looking toward the network (HLXC). "

REPR (PM Reports) = C-SIDE (Display Status) = LINE 1 (TL1)
REPC (PM Reports) = R-SIDE (Display Status) = LINE 2 (TL1)

9450-B

Note: NEND and FEND are not reported in HLX/HRX Status screens

Figure 548-4. HDSL HLXC/HLXR C-SIDE and R-SIDE Locations (MPU V5.1 With One HRX)

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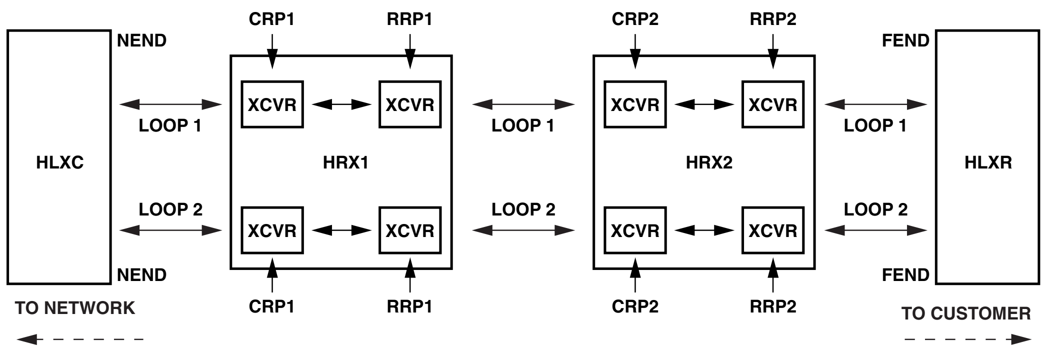

KEY

NEND means "at the HLXC, looking toward the customer (HLXR)."
FEND means "at the HLXR, looking toward the network (HLXC)."
CRP1 means "at the central office side of the HRX1, looking toward the network (HRX2/HLXR)."
RRP1 means "at the remote (CPE) side of the HRX1, looking toward the customer (HLXC)."
CRP2 means "at the central office side of the HRX2, looking toward the network (HLXR)."
RRP2 means "at the remote (CPE) side of the HRX2, looking toward the customer (HRX1/HLXC)."

CRP1 (Alarm History, PM Reports, and Status screens) = LINE 1 (TL1)
RRP1 (Alarm History, PM Reports, and Status screens) = LINE 2 (TL1)
CRP2 (Alarm History, PM Reports, and Status screens) = LINE 3 (TL1)
RRP2 (Alarm History, PM Reports, and Status screens) = LINE 4 (TL1)

NOTE: CRP2 and RRP2 are not present when there is no HRX2.

11375-A

Note: NEND and FEND are not reported in HLX/HRX Status screens

Figure 548-5. HDSL HLXC/HLXR CRP and RRP Locations (MPU V5.2 With Two HRXs)

SERIAL PORT CONFIGURATION

Summary: This procedure provides instructions for changing serial port configurations on the chassis to match the communications device parameters.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful… Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. From the Main Menu, use the arrow keys or number keys to select the System Configuration menu. Press Enter or Return.
2. Use the arrow keys or number keys to select Serial Port Configuration from the System Configuration menu. Press Enter or Return. A Serial Port Configuration screen is shown in Figure 549-1. The serial port defaults are listed Table 549-1.
3. Use the arrow keys to move to the **Craft Port Application** toggle field. Use the space bar to select CRAFT, TBOS, TL1, or NONE.
4. Move the cursor to the **Port 1/2 Application** toggle field. Use the space bar to select TBOS, CRAFT, TL1, or NONE. Selecting "TBOS" outputs TBOS to Port 1 (EIA-422) only. Selecting "CRAFT" or "TL1" outputs Craft or TL1 to Port 2 only. If Port 2 is configured for CRAFT, the Craft port on the front of the MPU can be configured for either TL1 or TBOS (EIA-232). At least one system port must be configured as Craft.
5. Move the cursor to the **Port 3 Application** toggle field. Use the space bar to select X.25, TBOS, CRAFT, TL1, INTERNAL, or NONE. When X.25 is selected, all other fields in that category are shown as Not Applicable.

   Reference: DLP-558 X.25 Port Configuration
6. Move the cursor to the **Craft Port Baud Rate** toggle field. Use the space bar to select 1200, 2400, 4800, or 9600 Baud; or AUTO.

➧ **Note:** The Craft port defaults to 9600 Baud. When AUTO is selected, pressing Enter or Return before logon will determine the communication speed (1200 – 19200 bps) for the session.

7. Move the cursor to the **Craft Port Parity** toggle field. Use the space bar to select EVEN, ODD, or NONE.

8. Move the cursor to the **Craft Port Data Bits** toggle field. Use the space bar to select 8 or 7.

9. Move the cursor to the **Craft Port Stop Bits** toggle field. Use the space bar to select 1 or 2.

10. Move the cursor to the **Craft Port Flow Control** toggle field. Use the space bar to select XON/XOFF or NONE. Craft Port defaults to NONE.

    ➧ **Note:** Some VT-100 terminal emulation programs for personal computers are not 100% VT-100 compatible, and irregularities in XON/XOFF flow control implementation may cause communication problems with the Soneplex MPU. If this occurs, configure the Flow Control field for the serial port in use to NONE. Before exiting the VT-100 terminal emulation program, log off the Craft Interface.

11. Move the cursor to the **Craft Port Keyboard Timeout** toggle field. After a specified period of keyboard inactivity, the user is logged off. Use the space bar to select 1, 5, 10, 15, 30, or 45 minutes, 1 hr, or NONE. The time-out feature is active only after a port is configured as Craft, and takes effect only after you log off the Craft Interface and then logon again.

12. Assign the selections by pressing Enter or Return.

13. Repeat Steps 6 through 12 for Port 1/2 and Port 3.

14. If a serial port was defined for TBOS operation, move the cursor to the **TBOS Mode** toggle field and select EXPANDED (default) or COMPRESSED.

15. If COMPRESSED TBOS mode was selected in Step 14, move the cursor to the **Display 1 Response Address** input field. Set the address for TBOS compressed display 1 to any number from 0 through 7. The chassis will return TBOS Display 1 data when it receives a TBOS request for that address.

16. If COMPRESSED TBOS mode was selected in Step 14, move the cursor to the **Display 2 Response Address** input field. Set the address for TBOS compressed display 2 to any number from 0 through 7. The chassis will return TBOS Display 2 data when it receives a TBOS request for that address.

    ➧ **Note**: The Display 2 Response Address must be different from the Display 1 Response Address.

17. Assign the selections by pressing Enter or Return.

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18. If you made changes to port configurations, log off and then log back on to the system to implement the changes.

    Reference: DLP-564 Craft Interface System Logoff

    Reference: DLP-526 Craft Interface System Logon

Stop! You have completed this procedure.

```
                    SERIAL PORT CONFIGURATION


Port Label           CRAFT     PORT 1/2  PORT 3
                     ========  ========  ========
Application     :    CRAFT     TBOS      X.25
Baud Rate       :    9600      2400      NOT APPL
Parity          :    NONE      ODD       NOT APPL
Data Bits       :    8         8         NOT APPL
Stop Bits       :    1         2         NOT APPL
Flow Control    :    NONE      NONE      NOT APPL
Keyboard Timeout:    30 MIN    NOT APPL  NOT APPL

                    TBOS CONFIGURATION

TBOS Mode                  : EXPANDED
Display 1 Response Address: NOT APPL
Display 2 Response Address: NOT APPL


                  Press CONTROL-A For Assistance
```

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Figure 549-1. Serial Port Configuration Screen

Table 549-1. Serial Port Default Settings

COMMUNICATION PARAMETER	CRAFT PORT (DCE)	PORT 1/2 (DTE)	PORT 3 (DTE)
Application	CRAFT	TBOS	X.25
Baud Rate	9600	2400	Not Applicable
Parity	NONE	ODD	Not Applicable
Data Bits	8	8	Not Applicable
Stop Bits	1	2	Not Applicable
Flow Control	NONE	NONE	Not Applicable
Keyboard Timeout	30 MIN	NOT APPL	Not Applicable

Note: For X.25 Port configuration, see DLP-558.

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SHELF HOUSEKEEPING ALARM LABELS

Summary: Use this selection to assign names to the housekeeping input alarm contacts. When a housekeeping alarm (door ajar, water on floor, fire alarm, etc.) occurs, the assigned name is displayed in the condition column of the Alarm History and Active Alarms screens. These conditions are also displayed in the related TL1 autonomous message.

➧ **Note:** Edits can be made in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be saved after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select System Configuration from the Main Menu. Press Enter or Return.

2. Select Shelf Housekeeping Labels from the System Configuration menu. Press Enter or Return. A Shelf Housekeeping Labels screen is shown in Figure 550-1.

3. Use the arrow keys to move to the **Condition Label** input fields. You may type over any existing alarm condition names or pressing the space bar to erase the text. Condition label names can be 1 to 16 characters in length. The first character must be an alpha character; middle characters can be alpha, numeric, or hyphens; and the last character must be either alpha or numeric.

4. Assign the entry by pressing Enter or Return.

5. Repeat Steps 3 through 4 for each alarm contact.

Stop! You have completed this procedure.

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```
                    SHELF HOUSEKEEPING LABELS

                       #  Condition Label
                       =  ================
                       1  HSKP1
                       2  HSKP2
                       3  HSKP3
                       4  HSKP4
                       5  HSKP5
                       6  HSKP6
                       7  HSKP7
                       8  HSKP8




                  Press CONTROL-A For Assistance
```

6143-A

Figure 550-1. Shelf Housekeeping Labels Screen

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MPU SOFTWARE DOWNLOAD COMMAND

Summary: This procedure is used to download the MPU software into an MPU module. This involves the transfer of two files. It requires 12 to 17 minutes to transfer both files, depending on the type of host computer and the communication program used.

Caution: *You must use a Version 5.X module with the Version 5.3 software.*

Caution: *Perform a configuration upload first. Refer to DLP-554 (Configuration Data Upload Command) for more information.*

1. Log on to the Craft Interface.

   Reference: DLP-526 Craft Interface System Logon

2. Select System Maintenance from the Main Menu using the arrow keys. Press Enter or Return. The System Maintenance menu displays, as shown in Figure 551-1.

3. At the System Maintenance menu, select Upload/Download Commands. Press Enter or Return. The Upload/Download Commands menu displays, as shown in Figure 551-2.

4. At the Upload/Download Commands Menu, select Execute Software Download. Press Enter or Return. The following message displays:

```
Preparing to execute new software download...
              Are You Sure? (y/n)
```

5. Begin the software download process by pressing Y for yes; or cancel the download process by pressing N for no.

6. If you press Y, all indicators on the APU will be on and the MPU status indicator will flash yellow/green. The following message displays:

```
Download In Progress
  Craft Logged Out
    Please Wait
```

7. Start the program used to transfer the MPU application software from the host computer to the MPU.

   Note: You must use the XMODEM protocol to transfer files.

8. Enter "v50_dlp" source file name from the host computer and start the file transfer process.

9. Enter the Version 5.3 MPU software source file name (mpu_5xxx.bin) from the host computer. Then start the file transfer process.

10. During the download, observe the indicators on the MPU and APU modules. During the download, the MPU Status LED continually flashes green/yellow, and all APU indicators flash.

11. If you cancel a download, repeat Step 7 and continue. If this fails, reset the MPU and restart this procedure from the beginning.

    ➧ **Note:** If the download is aborted and a "cancel" character is sent to the MPU, the MPU will reset for a new download attempt immediately. The cancel character is part of the XMODEM protocol supported by most software packages. If no cancel character is sent, **wait two minutes** before attempting another software download. The MPU takes two minutes to reset when no cancel character is sent.

    ➧ **Note:** If the new software has been loaded into the host computer, but the download process to the MPU has **NOT** been initiated, resetting the MPU allows the existing earlier version of Version 5 software to reboot. If the download has been initiated, the earlier version has been destroyed and a full download is necessary.

12. As the Version 5.3 MPU software download proceeds, the software existing in the MPU module is replaced. When the download completes, the MPU automatically restarts and runs self-test diagnostics. The MPU status indicator lights green when the download completes successfully. Verify the MPU status indicator is green.

    - If **Yes,** proceed to Step 13**.**
    - If **No**, and the MPU status indicator is red, repeat Step 7 and continue.

13. Affix the new version bar code sticker to the ejector tab of the MPU.

14. Affix the "2X" sticker to the MPU faceplate, above and to the left of the "STATUS" LED, below the ADC logo.

    ➧ **Note:** For V5.2 or later software, this indicates the MPU recognizes and supports two HDSL repeaters.

Stop! You have completed this procedure.

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```
                 SYSTEM MAINTENANCE

      1. Force/APS Commands
      2. Reset/LED Test Commands
      3. Execute ACO (Alarm Cut-Off)
      4. Loopback Status/Commands
      5. Display Inventory
      6. Display Circuit IDs
      7. Upload/Download Commands
      8. Test Access Unit Commands




          Press CONTROL-A For Assistance
```

5323-A

Figure 551-1. System Maintenance Menu

```
               UPLOAD/DOWNLOAD COMMANDS

      1. Execute Configuration Data Upload
      2. Execute Configuration Data Download
      3. Execute Software Download




          Press CONTROL-A For Assistance
```

9449-A

Figure 551-2. Upload/Download Commands Menu

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ALARM/EVENT NOTIFICATION LEVEL SETTING

Summary: This procedure provides instructions for filtering the alarm notification pop-up, based on the criticality of the alarm or event. When this feature is used, a beep is also heard each time the notification pop-up appears. Even with this feature disabled, all alarms and events are logged in the alarm database. The notification pop-up appears and the beep occurs any time an alarm occurs that is as critical or more critical than the level at which it is set.

➧ **Note:** A “toggle” field type means the user can press the space bar to view and select the next option that is described; or the user can press the “R” key to view and select the previous option. An “input” field type means the user must type an entry in the field according to the parameters described. A “fixed” field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message “Configuration Successful… Press Any Key To Continue” appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Alarm/Event Notification Level from the Alarms menu. Press Enter or Return. An Alarm/Event Notification Level screen is shown in Figure 552-1.

3. Use the space bar to scroll through the options, and stop at the selection you wish to enter.
   - Select EVENT to allow notification of all alarms and events as they occur.
   - Select MINOR to allow notification of all Minor, Major, and Critical alarms as they occur.
   - Select MAJOR (the default) to allow notification of all Major and Critical alarms as they occur.
   - Select CRITICAL to allow notification of all Critical alarms as they occur.
   - Select DISABLED to disable the notification of all alarms and events as they occur.

4. Assign the selection by pressing Enter or Return.

Stop! You have completed this procedure.

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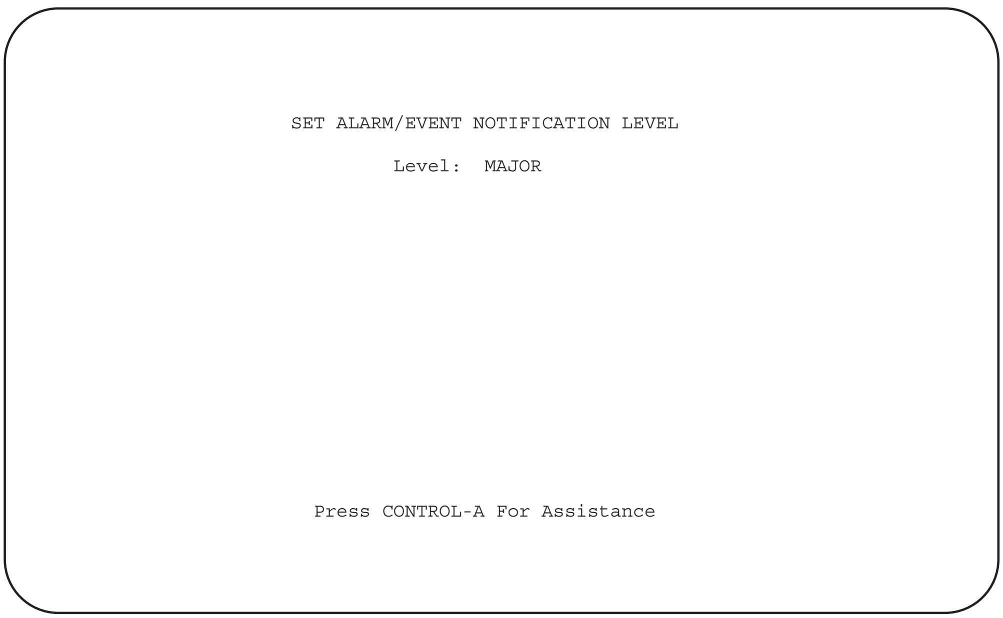

6144-A

Figure 552-1. Alarm/Event Notification Level

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DLX STATUS DISPLAY

Summary: This procedure provides instructions for displaying the status of the DLX modules installed in the selected chassis.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select Display Status from the Main Menu. Press Enter or Return.

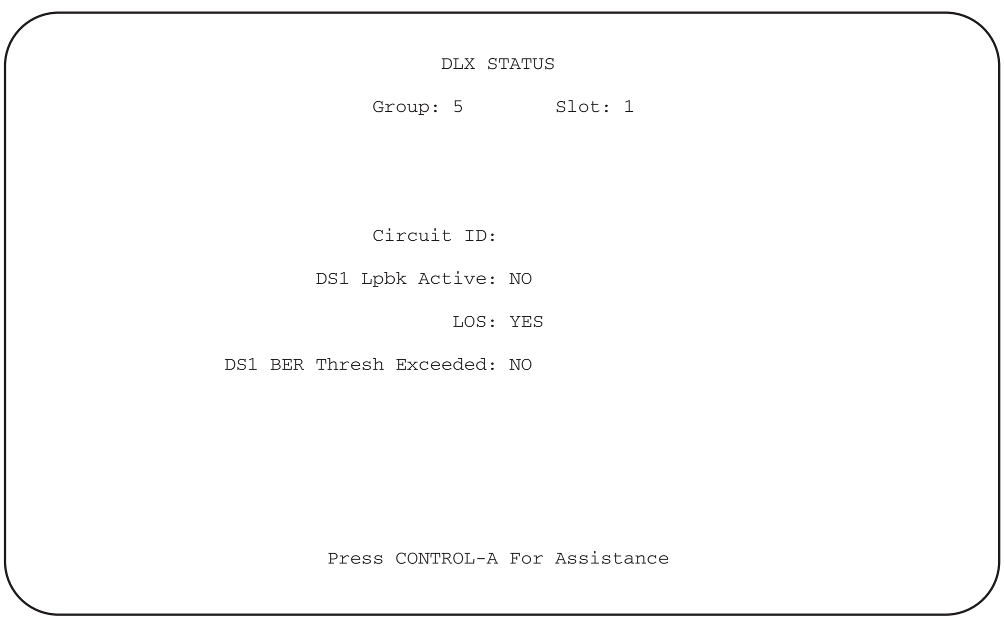
2. Use the arrow keys to select Display DLX Status from the Display Status menu. Press Enter or Return. A DLX Status screen is shown in Figure 553-1.

3. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

4. Move to the **Slot** toggle field. Select slot number 1, 2, 3, or 4.

   Reference: TAD-106 Access Identifier

Stop! You have completed this procedure.



6145-B

Figure 553-1. DLX Status Screen

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CONFIGURATION DATA UPLOAD COMMAND

Summary: This procedure provides instructions for copying the current MPU configuration data to an external device (host computer) for transfer to another MPU. A host computer containing software that can emulate a VT-100 terminal and perform XMODEM file transfers is required. Use this command to save the current MPU configuration data before installing a new (i.e., replacement) MPU in the chassis.

1. Use the arrow keys to select System Maintenance from the Main Menu. Press Enter or Return. The System Maintenance menu is shown in Figure 554-1.

2. At the System Maintenance menu, select Upload/Download Commands. Press Enter or Return. The Upload/Download Commands menu is shown in Figure 554-2.

3. Use the arrow keys to select Execute Configuration Data Upload from the Upload/Download Commands menu. Press Enter or Return.

4. The following message appears across the lower part of the screen.

```
Preparing To Upload Configuration Data From MPU...
               Are You Sure? (y/n)
```

5. Enable the Configuration Data Upload process by pressing Y for yes; or cancel upload by pressing N for no.

6. On the host computer, start the program sequence that will transfer the data.

   ➧ **Note:** Files must be transferred using the XMODEM protocol.

7. Enter a name for the file that will contain the MPU configuration data. Record the name assigned to the file and start the file transfer.

   ➧ **Note:** The file transfer will take several minutes. There are times during the transfer process when there are no signs of activity; this is normal.

8. When upload is finished, control is passed back to the System Maintenance menu. Verify that no error message appears on the screen.

   - If an error message **does not** appear, **Stop! You have completed this procedure.**
   - If an error message **does** appears, press any key and repeat Steps 3 through 7.

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```
                    SYSTEM MAINTENANCE

          1. Force/APS Commands
          2. Reset/LED Test Commands
          3. Execute ACO (Alarm Cut-Off)
          4. Loopback Status/Commands
          5. Display Inventory
          6. Display Circuit IDs
          7. Upload/Download Commands
          8. Test Access Unit Commands




              Press CONTROL-A For Assistance
```

5323-A

Figure 554-1. System Maintenance Menu

```
                 UPLOAD/DOWNLOAD COMMANDS

          1. Execute Configuration Data Upload
          2. Execute Configuration Data Download
          3. Execute Software Download




              Press CONTROL-A For Assistance
```

9449-A

Figure 554-2. Upload/Download Commands Menu

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CONFIGURATION DATA DOWNLOAD COMMAND

Summary: This procedure provides instructions for transferring MPU configuration data that was saved on an external device (host computer) back to an MPU. A host computer containing software that can emulate a VT-100 terminal and perform XMODEM file transfers is required. This procedure is used to transfer any saved MPU configuration data to a newly installed MPU.

⚠ **Caution:** *Any configuration database from an MPU with Version 3.1 or later software can be downloaded to an MPU with Version 5 software. When downloading to an MPU that is not running Version 5 software, the MPU software version of the source MPU must match the software version of the destination MPU.*

⚠ **Caution:** *This process will modify configuration that could affect traffic. Be sure of what you are doing.*

Note: When 3.1 through 4.2 MPU software is loaded to a Version 5 system, the database is converted automatically. Parameters in Version 5 that are not in the previous version are left at default.

1. Use the arrow keys to select System Maintenance from the Main Menu. Press Enter or Return. The System Maintenance menu is shown in Figure 555-1.

2. At the System Maintenance menu, select Upload/Download Commands. Press Enter or Return. The Upload/Download Commands menu is shown in Figure 555-2.

3. Use the arrow keys to select Execute Configuration Data Download from the Upload/Download Commands menu. Press Enter or Return. The following message appears across the lower part of the screen.

```
Preparing To Download Configuration Data To MPU...
                Are You Sure? (y/n)
```

4. Start the Configuration Data Download process by pressing Y for yes or cancel download by pressing N for no.

5. On the host computer, start the program sequence that will transfer the data.

   Note: Files must be transferred using the XMODEM protocol.

6. Enter the name of the file that contains the MPU configuration data and start the file transfer.

   Note: This transfer will take several minutes. During the transfer, some nonsense characters may appear at the top of your screen, but this is normal.

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7. After a download is finished, a message appears to indicate whether the download was successful or unsuccessful.
   - If **successful**, the MPU will reboot automatically to ensure that the configuration database takes effect. **Stop! You have completed this procedure.**
   - If **unsuccessful**, repeat Steps 3 through 6.

```
                         SYSTEM MAINTENANCE

                  1. Force/APS Commands
                  2. Reset/LED Test Commands
                  3. Execute ACO (Alarm Cut-Off)
                  4. Loopback Status/Commands
                  5. Display Inventory
                  6. Display Circuit IDs
                  7. Upload/Download Commands
                  8. Test Access Unit Commands



                   Press CONTROL-A For Assistance
```

5323-A

Figure 555-1. System Maintenance Menu

```
                       UPLOAD/DOWNLOAD COMMANDS

                  1. Execute Configuration Data Upload
                  2. Execute Configuration Data Download
                  3. Execute Software Download



                   Press CONTROL-A For Assistance
```

9449-A

Figure 555-2. Upload/Download Commands Menu

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DS1 PM CONFIGURATION

Summary: This procedure provides instructions for assigning thresholds for each DS1 in the Soneplex Broadband system. You can also view or edit the DS1 Performance Monitoring configuration for each DS1 in the Soneplex Broadband system from this screen. Not all modules support Performance Monitoring.

➧ **Note:** A “toggle” field type means the user can press the space bar to view and select the next option that is described; or the user can press the “R” key to view and select the previous option. An “input” field type means the user must type an entry in the field according to the parameters described. A “fixed” field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message “Configuration Successful… Press Any Key To Continue” appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Performance Monitoring from the Main Menu. Press Enter or Return. A Performance Monitoring menu appears.
2. Use the arrow keys to select DS1 PM Configuration from the PM Configuration menu. Press Enter or Return. A DS1 PM Configuration screen is shown in Figure 556-1.
3. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.
4. Move to the **Slot** toggle field. Select slot number 1, 2, 3, or 4.

   Reference: TAD-106 Access Identifier

5. Move to the **Mon Type Threshold** toggle fields. Enter the value for each field that you wish to change based on ranges and default values for each Mon Type listed in Table 556-1. Ranges are also listed at the bottom of the DS1 PM Configuration screen.

   Reference: TAP-102 Performance Monitoring Reports Description

6. Move to the **Mon Type Alarms** toggle fields. The following selections are possible:
   - Critical Allows notification of all Critical, Major, Minor, and Event alarms as they occur.
   - Major Allows notification of all Major, Minor, and Event alarms as they occur.
   - Minor Allows notification of all Minor and Event alarms as they occur.
   - Event Allows notification of all events as they occur.

   Reference: TAP-101 Alarm Troubleshooting
7. Assign the selections by pressing Enter or Return.
8. Repeat Steps 3 through 7 for each applicable DS1 signal in the chassis.

   Note: Pressing CONTROL-C and confirming with the Y key removes all threshold values and alarm level information from the database for the group and slot selected.

Stop! You have completed this procedure.

```
                    DS1 PERFORMANCE MONITORING CONFIGURATION

           Group: 1  Circuit: 1  Circuit ID:

       15 MINUTE         DAILY                      15 MINUTE         DAILY
MON  ============== ================    MON      ============== ================
TYPE THRSH ALM LVL THRSH   ALM LVL      TYPE     THRSH ALM LVL THRSH   ALM LVL
==== ===== ======== ======= ========    ======== ===== ======== ======= ========
FCP  5     EVENT    480     EVENT       AISSP    10    EVENT    100     EVENT
CVL  13340 EVENT    133400  EVENT       FCP-FE   5     EVENT    480     EVENT
ESL  65    EVENT    648     EVENT       ESL-FE   65    EVENT    648     EVENT
SESL 10    EVENT    100     EVENT       CVP-FE   13340 EVENT    133400  EVENT
LOSS 10    EVENT    100     EVENT       ESP-FE   65    EVENT    648     EVENT
CVP  13340 EVENT    133400  EVENT       SESP-FE  10    EVENT    100     EVENT
ESP  65    EVENT    648     EVENT       UASP-FE  10    EVENT    100     EVENT
SESP 10    EVENT    100     EVENT       CSSP-FE  10    EVENT    100     EVENT
UASP 10    EVENT    100     EVENT       SEFSP-FE 10    EVENT    100     EVENT
SASP 10    EVENT    100     EVENT

           CVs PER SESL: 1544  CVs PER SESP: 330  CVs PER SESP-FE: 330



        Press CONTROL-A For Assistance, CONTROL-C To Clear All PM Counts
```

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* Indicates valid range of values for selected field. See Table 556-1.

Figure 556-1. DS1 PM Configuration Screen

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Table 556-1. DS1 Threshold-Crossing Defaults and Range Values

LINE/PATH (NEND) THRESHOLDS				
MON TYPE	**15-MINUTE DEFAULT**	**15-MINUTE VALID RANGE**	**DAILY DEFAULT**	**DAILY VALID RANGE**
FCP	5	1 to 5	480	1 to 480
CVL	13340	1 to 16383	133400	1 to 1048575
ESL	65	1 to 900	648	1 to 65535
SESL	10	1 to 63	100	1 to 4095
LOSS	10	1 to 63	100	1 to 4095
CVP	13340	1 to 16383	133400	1 to 1048575
ESP	65	1 to 900	648	1 to 65535
SESP	10	1 to 63	100	1 to 4095
UASP	10	1 to 63	100	1 to 4095
SASP	10	1 to 63	100	1 to 4095
AISSP	10	1 to 63	100	1 to 4095
LINE/PATH (FEND) THRESHOLDS				
MON TYPE	**15-MINUTE DEFAULT**	**15-MINUTE VALID RANGE**	**DAILY DEFAULT**	**DAILY VALID RANGE**
FCP-FE	5	1 to 5	480	1 to 480
ESL-FE	65	1 to 63	648	1 to 65535
CVP-FE	13340	1 to 16383	133400	1 to 1048575
ESP-FE	65	1 to 900	100	1 to 65535
SESP-FE	10	1 to 63	100	1 to 4095
UASP-FE	10	1 to 63	100	1 to 4095
CSS-FE	10	1 to 63	100	1 to 4095
SEFSP-FE	10	1 to 63	100	1 to 4095

INTERNAL PARAMETER THRESHOLDS		
MON TYPE	**DEFAULT**	**VALID RANGE**
CVs per SESL	1544	1544 to 8000
CVs per SESP	320	320 to 333
CVs per SESP-FE	320	320 to 333

Note: refer to TAP-102 for Mon Type descriptions.

HDSL PM CONFIGURATION

Summary: This procedure provides instructions for assigning thresholds for each HDSL facility in the Soneplex Broadband system. You can also view or edit the HDSL Performance Monitoring configuration for each HDSL facility in the Soneplex Broadband system from this screen.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful… Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Performance Monitoring from the Main Menu. Press Enter or Return. A Performance Monitoring selection menu appears.

2. Use the arrow keys to select HDSL PM Configuration from the PM Configuration menu. Press Enter or Return. An HDSL PM Configuration menu is shown in Figure 557-1.

3. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

4. Move to the **Slot** toggle field. Select slot number 1, 2, 3, or 4.

   Reference: TAD-106 Access Identifier

5. Move to the **Mon Type Threshold** toggle fields. Enter the value for each field that you wish to change based on ranges and default values for each Mon Type listed in Table 557-1. Ranges are also listed on the HDSL PM Configuration screen.

   Reference: TAP-102 Performance Monitoring Reports Description

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6. Move to the **Mon Type Alarms** toggle fields. The following selections are possible:
   - Critical – Allows notification of all Critical alarms as they occur.
   - Major – Allows notification of all Major and Critical alarms as they occur.
   - Minor – Allows notification of all Minor, Major, and Critical alarms as they occur.
   - Event – Allows notification of all alarms and events as they occur.

   Reference: TAP-101 Alarm Troubleshooting

7. Assign the selections by pressing Enter or Return.
8. Repeat Steps 3 through 7 for each HDSL facility in the chassis.

Note: Pressing CONTROL-C and confirming with Y removes all threshold values and alarm level information from the database for the group and slot selected.

Stop! You have completed this procedure.

```
             HDSL PERFORMANCE MONITORING CONFIGURATION

         Group: 6  Circuit: 1  Circuit ID:

                      15 MINUTE              DAILY
                  ===================  ===================
         MONTYPE  THRESHOLD ALM LEVEL  THRESHOLD ALM LEVEL
         =======  ========= =========  ========= =========
         FCP      5         EVENT      480       EVENT
         CVP      6893      EVENT      67579     EVENT
         ESP      65        EVENT      648       EVENT
         SESP     10        EVENT      100       EVENT
         SEFSP    10        EVENT      100       EVENT

                          CVs PER SES: 165




   Press CONTROL-A For Assistance, CONTROL-C To Clear All PM Counts
```

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Figure 557-1. HDSL PM Configuration Screen (Typical)

Table 557-1. HDSL Threshold-Crossing Default and Range Values

PATH THRESHOLDS (ALL LOCATIONS)				
MON TYPE	15-MINUTE DEFAULT	15-MINUTE VALID RANGE	DAILY DEFAULT	DAILY VALID RANGE
FCP	5	1 to 5	480	1 to 480
CVP	6893	1 to 65535	67579	1 to 1048575
ESP	65	1 to 900	648	1 to 65535
SESP	10	1 to 900	100	1 to 65535
SEFSP	10	1 to 900	100	1 to 65535

INTERNAL PARAMETER THRESHOLDS		
MON TYPE	DEFAULT	VALID RANGE
CVs per SES	165	165 to 167

Note: refer to TAP-102 for Mon Type descriptions.

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X.25 PORT CONFIGURATION

Summary: Use this procedure to set several parameters that must be set before using the X.25 interface. Table 558-1, Table 558-2, and Table 558-3 outline the X.25 interface parameters and detailed technical specifications that are supported by the Soneplex Broadband system.

Data Link Layer LAPB Parameters

The Soneplex Broadband system data link layer uses the standard Link Access Procedure Balanced (LAPB) protocol. Parameters supported, set values, configurable options, and defaults are shown in Table 558-1.

Network Layer X.25 Packet Parameters

The Soneplex Broadband system now supports three Virtual Circuits, including two Permanent Virtual Circuits (PVCs) (each assigned to a separate TL1 or Craft interface), and one Switched Virtual Circuit (SVC). The X.25 interface operates only on Port 3. The PVC ID default assignments are shown in Table 558-2.

Other Network Parameters

Other supported network parameters, set values, configurable options, and defaults are shown in Table 558-3.

➧ **Note:** Edits can be made in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be saved after each change in one of two ways: 1) by pressing an arrow key and then the Enter or Return key **once**; or 2) by pressing the Enter or Return key **twice** after all selections and entries are made in the screen but before leaving the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select System Configuration from the Main Menu. Press Enter or Return.

2. Select X.25 Configuration and press Enter or Return. An X.25 Configuration screen is shown in Figure 558-1.

3. Use the arrow keys to move to each toggle field, and the space bar to make each selection. X.25 Configuration field defaults and options are listed in Tables 558-1, 558-2, and 558-3.

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4. Repeat Step 3 for each field that you wish to change.

5. Assign the selections by pressing Enter or Return.

6. Momentarily press RESET on the MPU front panel, or perform a soft reset, in order to re-initialize the X.25 configurations.

   Reference: DLP-519 MPU Replacement and Testing

   Reference: DLP-538 Reset/LED Test Commands

Stop! You have completed this procedure.

Table 558-1. Data Link Layer LAPB Parameters

DATA LINK PARAMETER	SET VALUE	RANGE	CONFIGURABLE DEFAULT
Address Field Assignment *		DTE, DCE (A=1, B=3)	DTE (A=3, B=1)
Modulo	8		
Window Size (K) *		1 to 7 frames	7
Frame Size (Bits per I frame) *		1080, 2104 bits	2104
N2 (retransmission count) *		2 - 16	7
T1 (retry timer) *		2 to 20 seconds	3 seconds
T2 (response delay timer)	0.3 seconds		
T3 (not supported)			
T4 (not supported)			

* These are user-programmable parameters through the Craft Interface.

Table 558-2. Virtual Circuit Default Assignments

VIRTUAL CIRCUIT	CIRCUIT TYPE	LOGICAL CHANNEL #	APPLICATION
1	PVC	1	TL1
2	PVC	2	Craft
3	SVC	N/A	N/A

Note: Autonomous messages are always sent except when inhibited by the TL1 INH-MSG command.

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Table 558-3. Network Layer X.25 Packet Parameters

NETWORK PARAMETER	SET VALUE	RANGE	CONFIGURABLE DEFAULT
PVC Logical Channel # *		1 - 255	See Table 558-2
Modulo	8		
Packet Size *		128, 256 octets	128
Window Size *		1 - 7	2
M bit Support	Yes		
Q bit Support (not supported)			
D bit Support *		No, Yes	Yes
Keyboard Time-Out		N/A for TL1; 0 minute, 1 minute, 5 minute, 10 minute, 15 minute, 30 minute, 45 minute, 1 hour	30 minute
SVC Craft Address		Up to 15 contiguous digits, each 0 to 9 or blank	(blank)
SVC TL1 Address		Up to 15 contiguous digits, each 0 to 9 or blank	(blank)

* These are user programmable parameters through the Craft Interface.

```
                X.25 CONFIGURATION

            Data Link (LAPB) Parameters
======================================================
Address Field Assignment: DTE           N2: 7
             Window Size: 7             T1: 3  seconds
              Frame Size: 2104 bits

             Network Layer Parameters
        ========================================
        Virtual Circuit -   1       2       3
                          ======  ======  ======
            Circuit Type: PVC     PVC     SVC
         Logical Channel: 1       2       N/A
             Application: TL1     CRAFT   N/A
             Packet Size: 128     128     128
             Window Size: 2       2       2
           D-bit Support: YES     YES     YES
        Keyboard Timeout: N/A     30 MIN  30 MIN

           SVC Craft Address:
             SVC TL1 Address:

             Press CONTROL-A For Assistance
```

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Figure 558-1. X.25 Port Configuration (with Default Settings)

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MPU ALARM LEVEL SETTING

Summary: This procedure provides instructions for setting MPU Alarm Levels.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful… Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Set Alarm Levels from the Alarms menu. Press Enter or Return.

3. Select Set MPU Alarm Levels from the Set Alarm Levels Menu. Press Enter or Return. An MPU Alarm Levels screen with default values is shown in Figure 559-1.

4. At the **Equipment/Shelf Alarms** toggle fields, select CRITICAL (CR), MAJOR (MJ), MINOR (MN), EVENT (EV) or NOT RPTD (not reported) for each field that you wish to change.

   ➧ **Note:** Abbreviations of the alarm field options (except NOT RPTD) will appear in the Active Alarms and Alarm History screens. In addition, what options you select at any alarm level setting screen will determine whether you will be notified of the alarm.

   Reference: DLP-552 Alarm/Event Notification Level Setting

5. Move to the **External Alarms** toggle fields. Select CRITICAL, MAJOR, MINOR, EVENT or NOT RPTD for each field that you wish to change.

   Reference: TAP-101 Alarm Troubleshooting

6. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

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```
                MPU ALARM LEVELS


      Equipment/Shelf Alarms
      ================================================
      CGA      : CRITICAL       GRP MISMATCH: MINOR
      APU FAIL : MAJOR          POWER       : MAJOR

      External Alarms
      ================================================
      HSKP1    : MINOR          HSKP5       : MINOR
      HSKP2    : MINOR          HSKP6       : MINOR
      HSKP3    : MINOR          HSKP7       : MINOR
      HSKP4    : MINOR          HSKP8       : MINOR




             Press CONTROL-A For Assistance
```

6149-C

Figure 559-1. MPU Alarm Levels (with Default Settings)

DS3 MUX ALARM LEVEL SETTING

Summary: This procedure provides instructions for setting DS3 MUX Alarm Levels.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful… Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Set Alarm Levels from the Alarms menu. Press Enter or Return.

3. Select Set MUX Alarm Levels from the Set Alarm Levels menu. Press Enter or Return. A DS3 MUX Alarm Levels screen is shown in Figure 560-1.

4. At the **Equipment Alarms** toggle fields, select CRITICAL (CR), MAJOR (MJ), MINOR (MN), EVENT (EV) or NOT RPTD (not reported) for each field that you wish to change.

   ➧ **Note:** Abbreviations of the alarm field options (except NOT RPTD) will appear in the Active Alarms and Alarm History screens. In addition, what options you select at any alarm level setting screen will determine whether you will be notified of the alarm.

   Reference: DLP-552 Alarm/Event Notification Level Setting

5. Move to the **MUX Facility Alarms** toggle fields. Select CRITICAL, MAJOR, MINOR, or EVENT for each field that you wish to change.

   ➧ **Note:** Default values are shown in Table 560-1.

   Reference: TAP-101 Alarm Troubleshooting

6. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

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```
                DS3MUX ALARM LEVELS


           Equipment Alarms
           ===========================
           BOARD FAIL        : MAJOR
           COMM FAIL         : MAJOR
           PROTECT COMM FAIL: MINOR

           MUX Facility Alarms
           ===========================
           FORCE TO WORKING : MINOR
           FORCE TO PROTECT : MINOR
           APS LIMIT         : MINOR
           DS3 LOS           : MAJOR
           DS3 LOF           : MAJOR
           DS3 AIS           : MAJOR
           DS3 YELLOW        : MINOR
           DS3 IDLE          : MINOR
           DS3 LOOPED BACK   : MINOR


         Press CONTROL-A For Assistance
```

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Figure 560-1. DS3 MUX Alarm Levels

Table 560-1. DS3 MUX Alarm Level Defaults

EQUIPMENT ALARMS		
	ALARM TYPE DEFAULT	
CONDITION	**ONLINE**	**OFFLINE**
BOARD FAIL	Major	Minor
COMM FAIL	Major	Minor
PROTECT COMM FAIL	Minor	Event
DS3 FACILITY ALARMS		
	ALARM TYPE DEFAULT	
CONDITION	**ONLINE**	**OFFLINE**
FORCE TO WORKING	Minor	Event
FORCE TO PROTECT	Minor	Event
APS LIMIT	Minor	Event
DS3 LOS	Major	Minor
DS3 LOF	Major	Minor
DS3 AIS	Major	Minor
DS3 YELLOW	Minor	Event
DS3 IDLE	Minor	Event
DS3 LOOPED BACK	Minor	Event

ODS2 MODULE ALARM LEVEL SETTING

Summary: This procedure provides instructions for setting ODS2 Alarm Levels.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful… Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Set Alarm Levels from the Alarms menu. Press Enter or Return.

3. Select Set ODS2 Alarm Levels from the Set Alarm Levels Menu. Press Enter or Return. An ODS2 Alarm Levels screen is shown in Figure 561-1.

4. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

   Reference: TAD-106 Access Identifier

5. Move to the **Equipment Alarms** toggle fields. Select CRITICAL (CR), MAJOR (MJ), MINOR (MN), EVENT (EV) or NOT RPTD (not reported) for each field that you wish to change.

   ➧ **Note:** Abbreviations of the alarm field options (except NOT RPTD) will appear in the Active Alarms and Alarm History screens. In addition, what options you select at any alarm level setting screen will determine whether you will be notified of the alarm.

   Reference: DLP-552 Alarm/Event Notification Level Setting

6. Move to the **DS2 Facility Alarms** toggle fields. Select CRITICAL, MAJOR, MINOR, EVENT, or NOT RPTD for each field that you wish to change.

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7. Move to the **DS1 Facility Alarms** toggle fields. Select CRITICAL, MAJOR, MINOR, EVENT, or NOT RPTD for each field that you wish to change.

   Reference: TAP-101 Alarm Troubleshooting

   Note: Default values are listed in Table 561-1.

8. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure..

```
                         ODS2 ALARM LEVELS

                              Group: 3
Equipment Alarms
==============================================================
BOARD FAIL      : MAJOR             PROTECT COMM FAIL: MINOR
COMM FAIL       : MAJOR             REMOTE COMM FAIL : MINOR
CONFIG MISMATCH: MINOR              VERSION MISMATCH : MINOR
HSKP1           : MINOR             HSKP2            : MINOR

DS2 Facility Alarms
==============================================================
APS LIMIT       : MINOR             OPTICAL LOF      : MAJOR
FORCE TO WORK   : MINOR             OPTICAL LOS      : MAJOR
FORCE TO PROT   : MINOR             T-BER            : MINOR
LASER DEGRADE   : MINOR

DS1 Facility Alarms       DS1 #1    DS1 #2    DS1 #3    DS1 #4
======================== ========= ========= ========= =======
LOOPED BACK    :          MINOR     MINOR     MINOR     MINOR
RECEIVE LOS    :          MAJOR     MAJOR     MAJOR     MAJOR
TRANSMIT EXZ   :          MINOR     MINOR     MINOR     MINOR
RECEIVE AIS    :          EVENT     EVENT     EVENT     EVENT

             Press CONTROL-A For Assistance
```

6152-C

Figure 561-1. ODS2 Alarm Levels Screen

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Table 561-1. ODS2 Alarm Level Defaults

EQUIPMENT ALARMS		
	ALARM TYPE DEFAULT	
CONDITION	ONLINE	OFFLINE
BOARD FAIL	Major	Minor
COMM FAIL	Major	Minor
CONFIG MISMATCH	Minor	Event
HSKP1	Minor	Event
PROTECT COMM FAIL	Minor	Event
OPTICAL COMM FAIL	Minor	Event
VERSION MISMATCH	Minor	Event
DS2 FACILITY ALARMS		
	ALARM TYPE DEFAULT	
CONDITION	ONLINE	OFFLINE
APS LIMIT	Minor	Event
FORCE TO WORK	Minor	Event
FORCE TO PROT	Minor	Event
LASER DEGRADE	Minor	Event
OPTICAL LOF	Major	Minor
OPTICAL LOS	Major	Minor
T-BER	Minor	Event
DS1 FACILITY ALARMS		
	ALARM TYPE DEFAULT	
CONDITION	ONLINE	OFFLINE
LOOPED BACK	Minor	Event
RECEIVE LOS	Major	Minor
TRANSMIT LOS	Major	Minor

HLX ALARM LEVEL SETTING

Summary: This procedure provides instructions for setting HLX Alarm Levels.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful… Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Set Alarm Levels from the Alarms menu. Press Enter or Return.

3. Select Set HLX Alarm Levels from the Set Alarm Levels Menu. Press Enter or Return. An HLX Alarm Levels screen is shown in Figure 562-1.

4. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

5. Move to the **Slot** toggle field. Select slot number 1, 2, 3, or 4.

   Reference: TAD-106 Access Identifier

6. Move to the **Equipment Alarms** toggle fields. Select CRITICAL (CR), MAJOR (MJ), MINOR (MN), EVENT (EV) or NOT RPTD (not reported) for each field that you wish to change.

   ➧ **Note:** Abbreviations of the alarm field options (except NOT RPTD) will appear in the Active Alarms and Alarm History screens. In addition, what options you select at any alarm level setting screen will determine whether you will be notified of the alarm.

   Reference: DLP-552 Alarm/Event Notification Level Setting

7. Move to the **DS1 Facility Alarms** toggle fields. Select CRITICAL, MAJOR, MINOR, EVENT, or NOT RPTD for each field that you wish to change.

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8. Move to the **HDSL Facility Alarms** toggle fields. Select CRITICAL, MAJOR, MINOR, EVENT, or NOT RPTD for each field that you wish to change.

   Reference: TAP-101 Alarm Troubleshooting

9. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

```
                              HLX ALARM LEVELS

                            Group: 6    Slot: 1

Equipment Alarms
=============================================================================
COMM FAIL        : MAJOR     HSKP1     : MINOR      PRIMARY POWER    : MAJOR
LOOP REVERSAL    : EVENT     HSKP2     : MINOR      SECONDARY POWER  : MAJOR
TP/RNG REVERSAL  : EVENT                            VERSION MISMATCH: MAJOR

DS1 Facility Alarms
=============================================================================
AIS              : EVENT     LOF       : MAJOR      T-BERL           : MINOR
CUSTOMER LOOPBACK: MINOR     LOS       : MAJOR      YELLOW           : EVENT
NETWORK LOOPBACK : MINOR

HDSL Facility Alarms
=============================================================================
DC CONTINUITY    : MAJOR     T-BERP FE: MINOR       T-SNR FE         : EVENT
LOF FE           : MAJOR     T-BERP NE: MINOR       T-SNR NE         : EVENT
LOF NE           : MAJOR     T-PA FE  : EVENT
RECOVERY         : MINOR     T-PA NE  : EVENT

                       Press CONTROL-A For Assistance
```

6153-C

Figure 562-1. HLX Alarm Levels Screen (with Default Values)

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Table 562-1. HLX Alarm Level Defaults

EQUIPMENT ALARMS	
CONDITION	**ALARM TYPE DEFAULT**
COMM FAIL	Major
HSKP1	Minor
HSKP2	Minor
LOOP REVERSAL	Event
TP/RNG REVERSAL	Event
PRIMARY POWER	Major
SECONDARY POWER	Major
DS1 FACILITY ALARMS	
CONDITION	**ALARM TYPE DEFAULT**
AIS	Event
LOOPBACK	Minor
LOF	Major
LOS	Major
T-BERL	Minor
YELLOW	Event
HDSL FACILITY ALARMS	
CONDITION	**ALARM TYPE DEFAULT**
DC CONTINUITY	Major
LOF FE	Major
LOF NE	Major
RECOVERY	Minor
T-BERP FE	Minor
T-BERP NE	Minor
T-PA FE	Event
T-PA NE	Event
T-SNR FE	Event
T-SNR NE	Event

DLX ALARM LEVEL SETTING

Summary: This procedure provides instructions for setting DLX Alarm Levels.

➧ **Note:** A “toggle” field type means the user can press the space bar to view and select the next option that is described; or the user can press the “R” key to view and select the previous option. An “input” field type means the user must type an entry in the field according to the parameters described. A “fixed” field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the “R” key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message “Configuration Successful… Press Any Key To Continue” appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow keys to select Alarms from the Main Menu. Press Enter or Return.
2. Use the arrow keys to select Set Alarm Levels from the Alarms menu. Press Enter or Return.
3. Select Set DLX Alarm Levels from the Set Alarm Levels Menu. Press Enter or Return. A DLX Alarm Levels screen with default values is shown in Figure 563-1.
4. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.
5. Move to the **Slot** toggle field. Select slot number 1, 2, 3, or 4.

   Reference: TAD-106 Access Identifier

6. Move to the **Equipment Alarms** toggle fields. Select CRITICAL (CR), MAJOR (MJ), MINOR (MN), EVENT (EV) or NOT RPTD (not reported) for each field that you wish to change.

   ➧ **Note:** Abbreviations of the alarm field options (except NOT RPTD) will appear in the Active Alarms and Alarm History screens. In addition, what options you select at any alarm level setting screen will determine whether you will be notified of the alarm.

   Reference: DLP-552 Alarm/Event Notification Level Setting

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7. Move to the **DS1 Facility Alarms** toggle fields. Select CRITICAL, MAJOR, MINOR, EVENT, or NOT RPTD for each field that you wish to change.

   Reference: TAP-101 Alarm Troubleshooting

8. Assign the selections by pressing Enter or Return.

Stop! You have completed this procedure.

```
  DLX ALARM LEVELS

Group: 5    Slot: 1

Equipment Alarms
==========================
COMM FAIL        : MAJOR

DS1 Facility Alarms
==========================
CUSTOMER LOOPBACK: MINOR
NETWORK LOOPBACK : MINOR
LOS              : MAJOR
T-BERL           : MINOR



Press CONTROL-A For Assistance
```

6154-B

Figure 563-1. DLX Alarm Level Defaults

CRAFT INTERFACE SYSTEM LOGOFF

Summary: This procedure provides instructions for logging off the Craft Interface system.

1. Press CONTROL-D to log off.

   Note: You will be logged off automatically if a period of keyboard inactivity exceeds a threshold (default is 30 minutes). You can change this threshold at the Serial Port Configuration menu. The change will take effect the next time you log on the Craft Interface.

2. If you are using a terminal, turn the power off. If using a host computer, exit the communications software, then turn the power off.

Stop! You have completed this procedure.

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PERFORMANCE MONITORING REPORTS RETRIEVAL

Summary: This procedure provides instructions for retrieving DS1 and HDSL 15-Minute PM, Daily PM, and Summary PM reports. Performance Monitoring reports are based on the data contained in the MPU memory.

1. Log on to the Craft Interface.

   Reference: DLP-526 Craft Interface System Logon

2. Use the arrow keys to select Performance Monitoring from the Main Menu. Press Enter or Return. A Performance Monitoring menu is shown in Figure 565-1.

3. Use the arrow keys to select PM Reports from the Performance Monitoring menu. Press Enter or Return. A Performance Monitoring Reports menu is shown in Figure 565-2.

4. Select DS1 PM Reports or HDSL PM Reports from the Performance Monitoring Reports menu. A sample DS1 PM Reports selection screen is shown in Figure 565-3.

5. Move to the **Group** toggle field. Select group number 1, 2, 3, 4, 5, 6, or 7.

6. Move to the **Circuit** toggle field. Select slot number 1, 2, 3, or 4.

   Reference: TAD-106 Access Identifier

7. If you selected DS1 PM Reports, move to the **Site** toggle field. Select LOCAL or REMOTE.

8. If you selected HDSL PM Reports, move to the **Loop** toggle field. Select 1 or 2.

9. Move to the **Report Type** toggle field. Select one of the following report types:
   - 15 Minute Performance Monitoring Report – This report displays the Mon Type PM data for the current 15 minute period and the previous thirty-two 15 minute periods.
   - Daily Performance Monitoring Report – This report displays the Mon Type PM data for the current day and the previous seven 24 hour periods.
   - Summary Performance Monitoring Report –This report displays the Mon Type PM data for the current 15 minute period, previous 15 minute period, current day, and previous day.

10. Press Enter or Return to display the report.

    Note: At this time, the only output format available is on the screen.

    Reference: TAP-102 Performance Monitoring Reports Description

Stop! You have completed this procedure.

```
                PERFORMANCE MONITORING


                 1. PM Configuration
                 2. PM Reports






            Press CONTROL-A For Assistance
```

9448-A

Figure 565-1. Performance Monitoring Menu

```
            PERFORMANCE MONITORING REPORTS


                 1. DS1 PM Reports
                 2. HDSL PM Reports






            Press CONTROL-A For Assistance
```

10389-A

Figure 565-2. Performance Monitoring Reports Menu

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```
                DS1 PERFORMANCE MONITORING REPORTS

Group: 6     Circuit: 1     Site: LOCAL      Report Type: 15-MINUTE
                  Circuit ID:




Modify Fields Above To Select Desired Report, Then Press RETURN
```

10391-A

Figure 565-3. Sample DS1 Performance Monitoring Reports Selection Screen

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Page 1 of 1

CIRCUIT ID DISPLAY

Summary: This procedure provides instructions for displaying the Access ID (AID), Circuit ID, and the Unit Type for each module installed in the Soneplex Broadband chassis.

➧ **Note:** Press CONTROL-A for help information about moving around and editing fields.

1. Use the arrow keys to select System Maintenance from the Main Menu. Press Enter or Return.

2. Use the arrow keys to select Display Circuit IDs from the System Maintenance menu. Press Enter or Return. A Display Circuit ID menu is shown in Figure 566-1.

   Reference: TAD-106 Access Identifier

Stop! You have completed this procedure.

```
                         DISPLAY CIRCUIT ID MENU

TID   : ADC

  AID        Circuit ID       Unit Type    AID        Circuit ID       Unit Type
======= ==================== ========= ======= ==================== =========
1-1-1-1                      RLX       1-4-3-1                      NONE
1-1-2-1                      NONE      1-4-4-1                      NONE
1-1-3-1                      NONE      1-5-1-1                      DLX
1-1-4-1                      NONE      1-5-2-1                      NONE
1-2-1-1                      NONE      1-5-3-1                      NONE
1-2-2-1                      NONE      1-5-4-1                      NONE
1-2-3-1                      NONE      1-6-1-1                      HLX
1-2-4-1                      NONE      1-6-2-1                      NONE
1-3-1-1                      ODS2      1-6-3-1                      NONE
1-3-2-1                      ODS2      1-6-4-1                      NONE
1-3-3-1                      ODS2      1-7-1-1                      HLX
1-3-4-1                      ODS2      1-7-2-1                      NONE
1-4-1-1                      NONE      1-7-3-1                      NONE
1-4-2-1                      NONE      1-7-4-1                      NONE

                      Press CONTROL-A For Assistance
```

6155-B

Figure 566-1. Display Circuit ID Screen

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RLX (OR RXLIOR) TO REPEATER VOLTAGE AND CURRENT TEST

Summary: This procedure provides instructions for measuring DC voltage and DC current being supplied by the RLX or RLXIOR module to the T1 span repeater. The V+, V–, I+, and I– jacks provide monitor access to the voltage and current supplied to the repeater through the DS1 span. Measurements are taken at the test jacks on the RLX module front panel across a 10 ohm resistor.

Measure DC Voltage

1. Refer to Figure 567-1 for an RLX front panel drawing. Select –VDC on the VOM and, if so equipped, select a voltage scale of 0 to 200 volts.

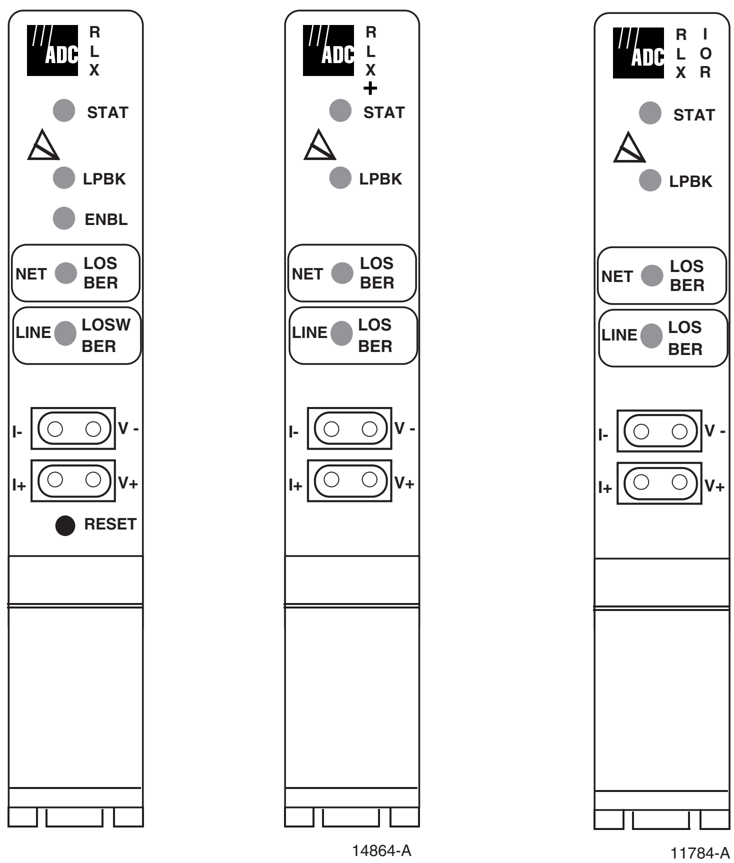
2. Insert the black test probe into the V– test jack, and insert the red test probe into the V+ test jack. Record the DC voltage for future reference.

Measure DC Current

3. Select –VDC on the VOM and, if so equipped, select the millivolt scale. The voltage in mV measured between the I+ and I– jack is equal to the current in mA.

4. Insert the black test probe into the I– test jack, and insert the red test probe into the I+ test jack. The meter should read approximately –600 mV (60 mA).

Stop! You have completed this procedure.



Version A2 RLX **Version B RLX** **RLXIOR**

Figure 567-1. RLX Module Front Panel Layouts

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VERSION C HLXC VOLTAGE TO HLXR TEST

Summary: This procedure provides instructions for measuring DC voltage and DC current being supplied by the Version C HLXC to the HLXR. The V+, V–, I+, and I– jacks provide monitor access to the voltage and current supplied to the HLXR through the HDSL span. These measurements are taken at the HLXC's test jacks across a 10 Ohm resistor.

Measure DC Voltage

1. Select –VDC on the VOM and, if so equipped, select a voltage scale of 0 to 200 volts.

2. Refer to Figure 568-1 for a front panel drawing of the HLXC. Insert the black test probe into the V– test jack, and insert the red test probe into the V+ test jack. A typical meter reading should be approximately 130 volts depending on the cable length in the loop.

Measure DC Current

3. Select –VDC on the VOM and, if so equipped, select the millivolt scale. The voltage in mV measured between the I+ and I– jack is equal to the current in mA.

4. Insert the black test probe into the I– test jack, and insert the red test probe into the I+ test jack. The meter should typically read between –550 and –900 mV (55 to 90 mA).

Stop! You have completed this procedure.

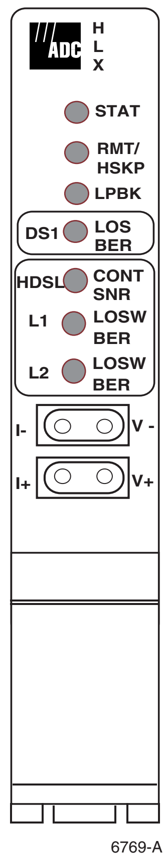

Figure 568-1. Version C HLXC Module Front Panel

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RLX-EQUIPPED CIRCUIT CROSS-CONNECTS

Summary: RLX modules can be configured to supply span power over the DS1 pairs to power the repeater modules. To remove current from the pairs before making cross-connects, partially withdraw each RLX module from the chassis so that electrical contact with the rear connector is broken. Make necessary cross-connects, then re-install the RLX modules.

Caution: *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

1. Open the chassis cover.

2. Use the ejector at the bottom of each RLX front panel to carefully disengage the module from its connector.

3. Partially withdraw each RLX module from its mounting slot to break electrical contact with the backplane connector.

   Note: The RLX can be configured to supply span power over the DS1 pairs to supply power to the repeater modules. Partially withdrawing the RLX ensures that current is not present when cross-connects are installed.

4. At the central office, make necessary cross-connects at the Main Distribution Frame or other facility, in accordance with local practice.

5. At the remote location, make necessary cross-connects at the remote distribution frame or other facility, in accordance with local practice.

6. Insert the RLX modules into their mounting slots.

Stop! You have completed this procedure.

RTAU OPERATION

Summary: This procedure provides instructions for operating the Remote Test Access Unit (RTAU). The RTAU can be used to drop or insert DS1 signals either toward the network (DS3 interface) or the customer interface (i.e., the DS1 distribution modules) for monitoring or intrusive testing.

➧ **Note:** A "toggle" field type means you can press the space bar to view and select the next option that is described; or press the "R" key to view and select the previous option. An "input" field type means you must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits can be **saved** into the configuration database after each change is made in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful… Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

➧ **Note:** Be sure to configure the line card to be tested before setting up test access.

➧ **Note:** The RTAU's status can also be displayed using the Shelf Status screen, where the letter "R" in the TAU slot column means an RTAU is present.

Reference: DLP-545 Shelf Status Display

1. Refer to Figure 570-1. Check the RTAU front panel for the STATUS LED lighted green, indicating that the module is operating normally.

2. Log on to the Craft Interface. The Main Menu screen appears.

   Reference: DLP-526 Craft Interface Logon

3. Use the arrow or number keys to select System Maintenance from the Main Menu. Press Enter or Return. The System Maintenance screen appears, as shown in Figure 570-2.

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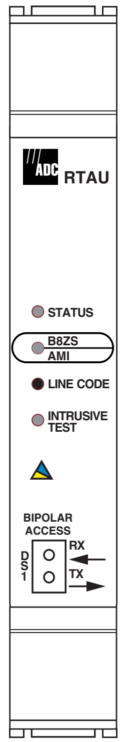


12693-A

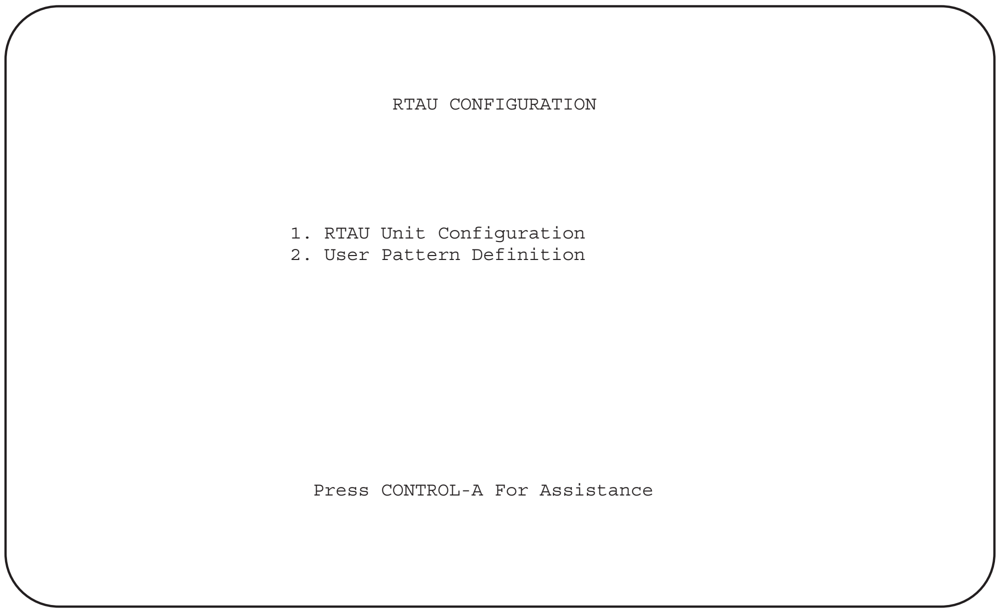
Figure 570-1. RTAU Front Panel

```
                 SYSTEM MAINTENANCE

      1. Force/APS Commands
      2. Reset/LED Test Commands
      3. Execute ACO (Alarm Cut-Off)
      4. Loopback Status/Commands
      5. Display Inventory
      6. Display Circuit IDs
      7. Upload/Download Commands
      8. Test Access Unit Commands




          Press CONTROL-A For Assistance
```

5323-A

Figure 570-2. System Maintenance Menu

4. Use the arrow or number keys to select Test Access Unit Commands. Press Enter or Return. The RTAU Configuration screen appears, as shown in Figure 570-3.



14868-A

Figure 570-3. RTAU Configuration Menu

Note: The User Pattern Definition screen is not available for the MPU 5.3 release.

5. Use the arrow or number keys to select RTAU Unit Configuration from the RTAU Configuration menu. Press Enter or Return. The 'RTAU Config' screen appears, as shown in Figure 570-4.

   Note: If the **neither** the **RTAU** or **TAU** are plugged into the chassis, the Test Access Unit Status/Commands screen, shown in Figure 570-5, can still be accessed from the System Maintenance menu. But in this case it cannot be configured.

   However, if the **TAU** is plugged into the chassis, the Test Access Unit Status/Commands screen **can** be configured after accessing it from the System Maintenance menu. Refer to the Soneplex Test Access Unit Installation Instructions, listed under Related Publications at the beginning of this manual, for more information about the TAU.

6. To prepare the RTAU for operation, set the parameters shown on the 'RTAU Config' screen. Refer to Figures 570-6 through 570-14 for test diagrams and mode schematics. Refer to Table 570-1 for details regarding parameter options. Use the arrow keys to move from field to field. Assign the selections by pressing Enter or Return.

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7. To start a test, set the Measurement field to START. The RTAU waits for pattern sync or frame sync (for framed patterns) before beginning measurement (see Figure 570-15). After syncing, the test begins and the Measurement display changes to RUNNING.

8. As a test progresses, the results are displayed on the RTAU Config screen, in the 'Error Counts' and 'Elapsed Time' columns.

9. To terminate a test, set the Measurement field to STOP. Setting the Mode field to DISABLE also stops any measurements in progress and terminates the test.

10. To end a test session and restore the tested circuit to normal operation, set the Mode field to DISABLE.

Stop! You have completed this procedure.

```
                             RTAU CONFIG

EQUIPMENT SETUP
===============
Current User   : CRAFT                             Test Circuit: 1-1
Line Code      : INTERNAL                          Mode        : DISABLE

SIGNAL GENERATOR SETUP
======================
Pattern Type   : QRS             -------------------------------------
Frame Format   : UNFRAMED
Loop Code      : NONE                                  ---------------

BIT ERROR SETUP         Error Counts            Status    Elapsed Time
===============         ============            ======    ============
Error Count    : 0      Data :                  F Sync:   ES :
Error Rate     : OFF    BPV  :                  P Sync:   EFS:
Error Locn     : N/A    Frame:                  RAI   :
                        CRC  :
                        COFA :

Test Timeout   : 60     Measurement    : STOP
In Minutes
                     Press CONTROL-A For Assistance
```

14866-A

Figure 570-4. RTAU Config Screen
(Showing Defaults for Screen With Line Code Field Set to INTERNAL)

```
                    TEST ACCESS UNIT STATUS/COMMANDS

                               Group:  1          DS1#:  2

          Drop Direction      Insert Direction
          ==============      ================
Status   :     NONE                   NONE

Command  :

                TAU Present Status: NO







                       Press CONTROL-A For Assistance
```

14851-A

Figure 570-5. Test Access Unit Status/Commands Screen

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Table 570-1. RTAU Configuration Fields

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
EQUIPMENT SETUP FIELDS				
Current User	Toggle		OVERVIEW: The Current User field can only be set to NONE or CRAFT from the Craft menu. If the Current User field is set to NONE, the Mode field is automatically set to DISABLE. However, to change this field to CRAFT, the Mode field must first be set to an option other than DISABLE. At that point, the Current User field is automatically set to CRAFT.	NONE
		NONE	The RTAU is not being used.	
		CRAFT	The RTAU is being controlled via the Craft.	
		TL1	The RTAU is being controlled via the TL1 interface. This option cannot be enabled from the Craft menu. When a "Connect Test Access T1" command is issued, the Current User field is automatically set to TL1.	
Line Code	Toggle		OVERVIEW: If external test equipment is being used, set the Line Code field to either AMI or B8ZS. (External test equipment required: T-Berd 211 DS1 test set or equivalent that can generate a T1 signal.) If the internal signal monitor and signal generator of the RTAU is being used, set the line code to INTERNAL. In addition, when an intrusive test mode is selected and the line code is set to INTERNAL, the signal generator "Pattern Type" field defaults to QRS to transmit an unframed QRSS signal.	B8ZS
		INTERNAL	Disables RTAU front panel bantam jacks for test access. Selects internal TSG and SPD.	
		B8ZS	Enables Bipolar Eight-Zero Substitution line code through the Craft Interface.	
		AMI	Enables Alternate Mark Inversion line code through the Craft Interface.	
Test Circuit	Input	1-1 thru 1-4, 2-1 thru 2-4, 3-1 thru 3-4, 4-1 thru 4-4, 5-1 thru 5-4, 6-1 thru 6-4, 7-1 thru7-4	Group and slot number to be dropped by the DS3 MUX. The Test Circuit option can only be changed if the value set in the Mode field is DISABLE.	1-1

(continued)

Table 570-1. RTAU Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
EQUIPMENT SETUP FIELDS, continued				
Mode	Toggle	OVERVIEW: Valid access modes and the resulting configurations are shown in Figure 570-6 (RTAU Test Configuration Block Diagram), Figure 570-7 (MONF and MONE), Figure 570-8 (SPLTB and SPLTA), Figure 570-9 (Typical Round-Robin Test Configuration), Figure 570-10 (Typical End Test Configuration), Figure 570-11 (SPLTF and SPLTE), Figure 570-12 (Typical Point-to-Point Test Configuration), Figure 570-13 (SPLTFL and SPLTEL), and Figure 570-14 (LOOPF and LOOPE). In addition, when the Mode field change is saved by pressing the Enter or Return key, the MPU will instruct the DS3 MUX to drop and insert the selected circuit.		DISABLE
		MONE	Non-intrusive monitor access to the A pair.	
		MONF	Non-intrusive monitor access to the B pair.	
		SPLTA	SPLTA mode indicates a split in the A transmission path with a TSG (Test Signal Generator) connected in the F direction, and an SPD (Signal Presence Detector) connected to the signal from the E direction.	
		SPLTB	SPLTB mode indicates a split in the B transmission path with a TSG connected in the E direction, and an SPD connected to the signal from the F direction.	
		SPLTE	SPLTE mode indicates a split in both the A and B transmission paths. An SPD is connected to the line incoming from the E direction and a TSG is connected to the line outgoing to the E direction. The line outgoing in the F direction is connected to a QRSS source, and the line incoming from the E direction is terminated by the nominal characteristic impedance of the line.	
		SPLTF	SPLTF indicates a split in both the A and B transmission paths with a TSG connected to the line outgoing to the F direction, and an SPD connected to the line incoming from the F direction. The line outgoing in the E direction is connected to a QRSS source, and the line incoming from the E direction is terminated by the nominal characteristic impedance of the line.	
		SPLTEL	SPLTEL indicates a split in both the A and B paths and connects an SPD to the line incoming from the E direction and a TSG to the line outgoing in the E direction similar to SPLTE mode. The signal in the F direction is looped back.	

(continued)

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Table 570-1. RTAU Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
EQUIPMENT SETUP FIELDS, continued				
Mode, continued	Toggle	SPLTFL	SPLTFL indicates a split in both the A and B paths and connects an SPD to the line incoming from the F direction and a TSG to the line outgoing in the F direction similar to SPLTF mode. The signal in the E direction is looped back.	
		LOOPE	The LOOPE mode is a full split of both A and B transmissions paths. The incoming line in the E direction is connected to the SPD and this line is connected to the outgoing line in the E direction. The circuit will be looped in one direction. The outgoing line in the F direction (non-test direction) will be connected to a QRSS source and the line incoming from the F direction is terminated by the nominal characteristic impedance of the line.	
		LOOPF	The LOOPF mode is a full split of both A and B transmissions paths. The incoming line in the F direction is connected to the SPD and this line is connected to the outgoing line in the F direction. The circuit will be looped in one direction. The outgoing line in the E direction (non-test direction) will be connected to a QRSS source and the line incoming from the E direction is terminated by the nominal characteristic impedance of the line.	
		DISABLE	When DISABLE is selected, no monitor or split access can take place. Setting the Mode field to DISABLE also stops any measurement in progress, as if the Measurement field (described below) had been set to STOP.	
SIGNAL GENERATOR SETUP FIELDS				
Pattern Type	Toggle		OVERVIEW: If the desired pattern type is not available, select the User Code option to enter a pattern 32 bits or less.	QRS
		QRS	Quasi-Random Signal. QRS (2^{20}-1) is a 1,048,575-bit sequence generated by a 20-stage shift register with feedback taken from the 17th and 20th stages. The non-inverted output is taken from the 20th stage, and an output bit is forced to be a ‘1’ whenever the next 14 bits are all 0’s. QRS is typically used to verify continuity and to check circuit performance in the presence of traffic-like signals. QRS (Quasi-random Signal) is a signal repeated every 1 to 24 bits as specified by the OS (Operation System) application. QRS must conform to the description in Bellcore TR-NPL-000054.	

(continued)

Table 570-1. RTAU Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
SIGNAL GENERATOR SETUP FIELDS, continued				
Pattern Type, continued	Toggle	2^15-1	2^{15}-1 is a 32,767-bit, pseudo-random pattern that generates a maximum of 14 sequential 0's and 15 sequential 1's. The pattern provides a maximum number of 0's allowed for framed, non-B8ZS testing. The pattern does not meet the minimum 1's density requirement.	
		2^23-1	2^{23}-1 is a 8,388,607-bit. pseudo-random pattern that generates a maximum of 22 sequential 0's and 23 sequential 1's. The pattern exceeds excess 0's and does not meet the minimum 1's density requirements for T1 applications.	
		All Ones	Test of T1 span line. The all-1's pattern causes the span line repeater to consume the maximum amount of power. If the current powering the span line is low, transmission errors may occur due to the inter-symbol interference resulting from the inability of a weak repeater power supply to develop the energy necessary to support the transmission of a long sequence of 1's.	
		(Framed) All Zeros	Used as a final confirmation that all network elements in a circuit are properly optioned with B8ZS for clear channel operation. The framed all 0's pattern consisting of a frame bit followed by an all 0's payload, will only be applied to circuit optioned with B8ZS for clear channel operation.	
		3 in 24	Used to determine the ability of network equipment to function properly when transporting signal sequences containing both a maximum of 15 consecutive 0's during periods of minimum overall pulse density. • Unframed = 1000 1000 1000 0000 0000 0000 1000 1000 • Framed = 0100 0100 0000 0000 0000 0100 0100 1000	
		2 in 8	Used in conjunction with the 1-in-8 pattern. Useful when performing test to reveal the presence of incorrectly-optioned AMI or B8ZS equipment. Use of the 2-in-8 pattern will confirm the circuits ability to support error-free transmission. • Unframed = 0100 0010 0100 0010 • Framed = 0100 0010 0100 0010	

(continued)

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Table 570-1. RTAU Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
SIGNAL GENERATOR SETUP FIELDS, continued				
Pattern Type, continued	Toggle	1 in 8	Containing strings of 7 sequential 0's. It is used to determine the ability of a circuit to handle payload signals having minimum 1's density. Use of this pattern often reveals the existence of timing recovery problem under conditions of low signal density. • Unframed = 1000 0000 1000 0000 • Framed = 0100 0000 0100 0000	
		DALY	Daly Pattern (Modified 55 Octet). This is useful for stressing the timing recovery circuits of line cards and the preamplifier/ equalizer circuits of repeaters. The pattern stresses a circuit by introducing rapid transitions from long sequences of low density octets to high density octets, high density octets to low density octets, and rapid transitions. The pattern may be transmitted framed or unframed. When framed, the frame bit shall be inserted at the octet boundaries and will not overwrite the bits.	
		User Code	For user-defined patterns of 32 bits or less, set the Pattern Type field to User Code. The bits can be entered by typing a string of 0's or 1's in the bit field located to the right of the designated entry.	
Pattern Bits	Display only	None	If the Pattern Type field is configured for User Code, pattern bits will be displayed to the right of the Pattern type field parameter. This field's name is not shown on the screen. If no User Code is entered in the Pattern Type field, this field displays 32 dashes.	None
Frame Format	Toggle	UNFRAMED	Unframed data pattern.	UNFRAMED
		Ft ONLY	Used for SLC framing.	
		SF	Super Frame	
		ESF	Extended Super Frame	

(continued)

Table 570-1. RTAU Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
SIGNAL GENERATOR SETUP FIELDS, continued				
Loop Code	Toggle	OVERVIEW: The Mode field must be set to a SPLT option before the Loop Code field can be configured. Loop codes will be transmitted until the RTAU detects a change in the signal being received. At that time, the pattern selected before the loop code was set will be transmitted. For example, when sending a Loop Up code, the RTAU will restore the original pattern after it receives the loop code it is transmitting, indicating that the circuit is looped up. Note that the Loop Code bits are displayed in the Loop Code bit field as each code is selected. This is provided as a convenience to the operator who may not know the name chosen for the loop code but does know the pattern.		NONE
		Line Loop Up	10000	
		Line Loop Down	100	
		4-Bit Loop Up	1100	
		4-Bit Loop Down	1110	
		5-Bit Loop Up	11000	
		5-Bit Loop Down	11100	
		ESF CSU Loop Up	0EFF (0000 1110 1111 1111)	
		ESF CSU Loop Down	38FF (0011 1000 1111 1111)	
		ESF NI* Loop Up	12FF (0001 0010 1111 1111)	
		ESF NI* Loop Down	24FF (0010 0100 1111 1111)	
		ESF CSU Payload Loop Up	14FF (0001 0100 1111 1111)	
		ESF CSU Payload Loop Down	32FF (0011 0010 1111 1111)	
		User Loop Up (toggle and input)	Enter a 16-value expression using only 1’s, 0’s, or “-”. The bits can be entered by typing a string of 0’s or 1’s in the bit field located to the right of the designated entry.	
		User Loop Down	Enter a 16-value expression using only 1’s, 0’s, or “-”. The bits can be entered by typing a string of 0’s or 1’s in the bit field located to the right of the designated entry.	
		NONE	Disables any active loop code selected for this field. When NONE is selected, the Loop Code field displays 16 dashes.	

*Note: “NI” means Network Interface device.

(continued)

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Table 570-1. RTAU Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
BIT ERROR SETUP FIELDS				
			OVERVIEW: Bit errors can be injected by the RTAU using the Bit Error Set Up fields. These sections are display-only fields that are only displayed when the line code setting is INTERNAL. The Status field always shows the current status if the line code is INTERNAL, but the Error Counts and Elapsed Time fields only show a value when a measurement is being made.	
Error Count	Input	Range of 0 to 1544	Select either Error Count or Error Rate for bit error setup. Both cannot be set at the same time. If single errors or a burst of errors is desired, set the Error Count field to the number of errors to insert. If the Error Count field is set, the number of errors will be transmitted each time the Enter key is pressed.	0
Error Rate	Toggle	OFF, 1E-3, 1E-4, 1E-5, 1E-6, 1E-7	Select either Error Count or Error Rate for bit error setup. Both cannot be set at the same time. If a steady error rate is desired, set the Error Rate field, which indicates the rate bit or frame errors are injected.	Off
Error Locn	Toggle		OVERVIEW: The Error Location field must be set to either PAYLOAD or FBE if the count or rate field is set. Pressing the Enter or Return key will cause the RTAU to send the errors.	N/A
		N/A	Indicates count is 0 and rate is off.	
		PAYLOAD	Bit errors are injected.	
		FBE	Frame Bit Error. Frame errors are injected.	
Error Counts – Data	Display only	None	Eight-digit counter or blank.	Blank
Error Counts – BPV	Display only	None	Eight-digit counter or blank.	Blank
Error Counts – Frame	Display only	None	Eight-digit counter or blank.	Blank
Error Counts – CRC	Display only	None	Eight-digit counter or blank.	Blank
Error Counts – COFA	Display only	None	Eight-digit counter or blank.	Blank
Status – F Sync	Display only	None	* or blank	Blank
Status – P Sync	Display only	None	* or blank	Blank
Status – RAI	Display only	None	* or blank	Blank

(continued)

Table 570-1. RTAU Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
BIT ERROR SETUP FIELDS, continued				
Elapsed Time – ES	Display only	None	Six-digit counter or blank.	Blank
Elapsed Time – EFS	Display only	None	Six-digit counter or blank.	Blank
Test Timeout in Minutes	Input	0 to 1440	Timeout counter for test access. If the counter is set to a number higher than “0” and then reaches “0” during test, the Mode field will be set to DISABLE automatically. If the counter is set to “0”, the test timeout will be turned off, and the test will have unlimited time.	60
Measurement	Toggle		OVERVIEW: Start a measurement by selecting START at the Measurement field. The RTAU will wait for pattern sync and frame sync for framed patterns before starting the measurement. After synching, the measurement display will change to RUNNING. Stop any measurement by selecting STOP. Refer to Figure 570-15 for an RTAU Config screen showing a test that is starting. **Note:** If the Mode is set to MONE, MONF, LOOPE, or LOOPF, only frame sync is required before starting the measurement. If the pattern is not in sync, then the Data Error Counts will read “N/A” until pattern sync is established.	STOP
		START	Initiate measurement.	
		STOP	Terminate measurement. **Note:** Setting the Mode field to DISABLE also stops any measurement in progress, as if the Measurement field had been set to STOP.	
		RUNNING (display)	Measurement active.	
Waiting on Sync	Display only	None	This parameter is displayed to the right of the Measurement field when the Measurement field is set to START. The WAITING ON SYNC message is display only; it only shows up when the RTAU is waiting for either frame or pattern sync. Examine the status section to determine what sync is needed.	Blank
Mode	Toggle	DISABLE	To end the test session, restore the tested circuit to normal operation by selecting DISABLE.	DISABLE

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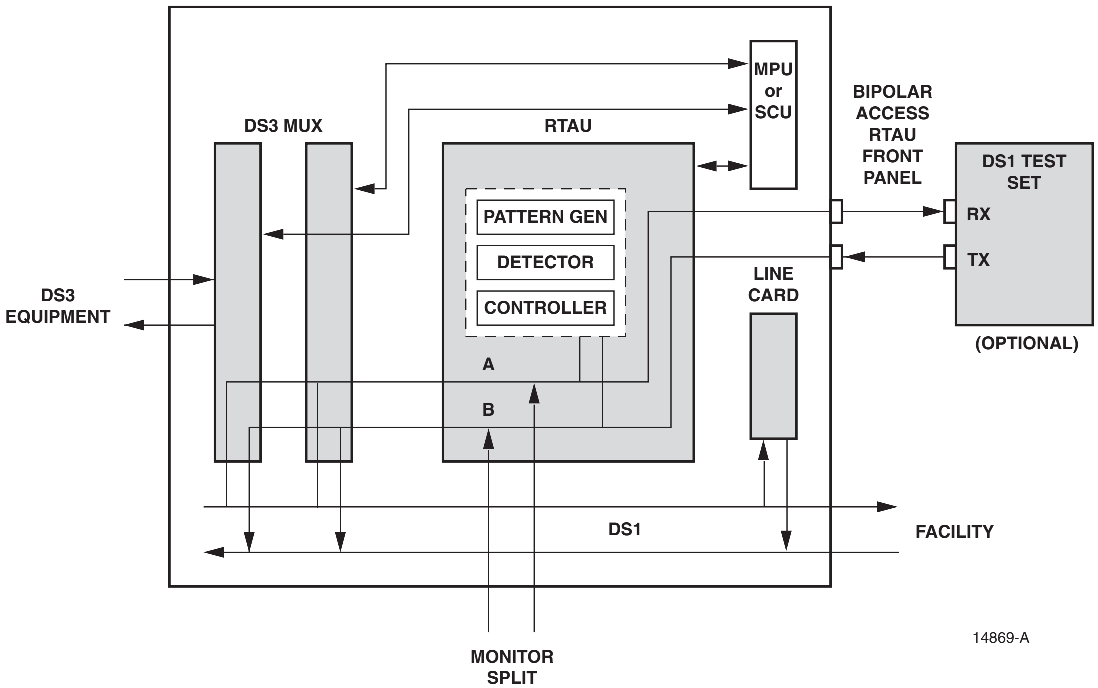

Figure 570-6. RTAU Test Configuration Block Diagram

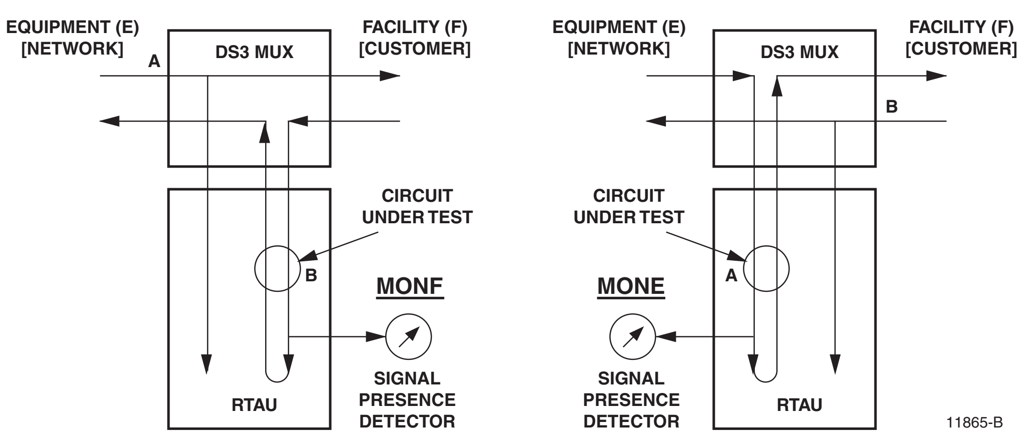

Figure 570-7. MONF and MONE

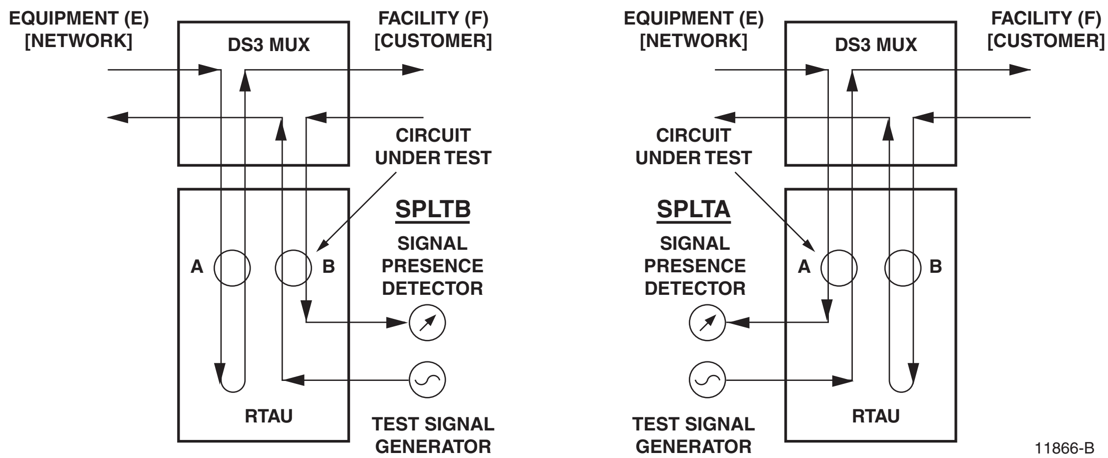

Figure 570-8. SPLTB and SLPTA

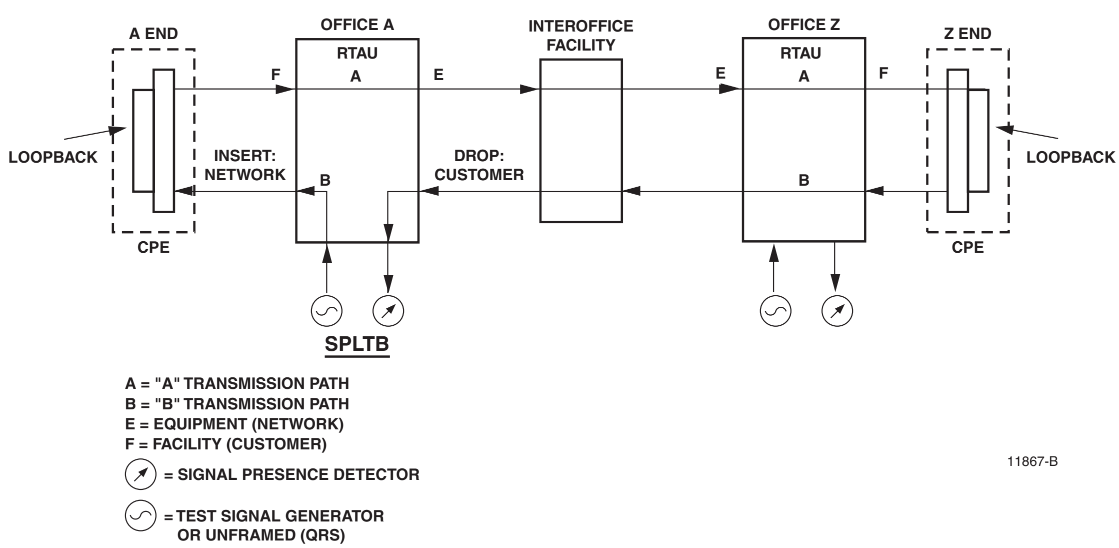

Figure 570-9. Typical Round-Robin Test Configuration

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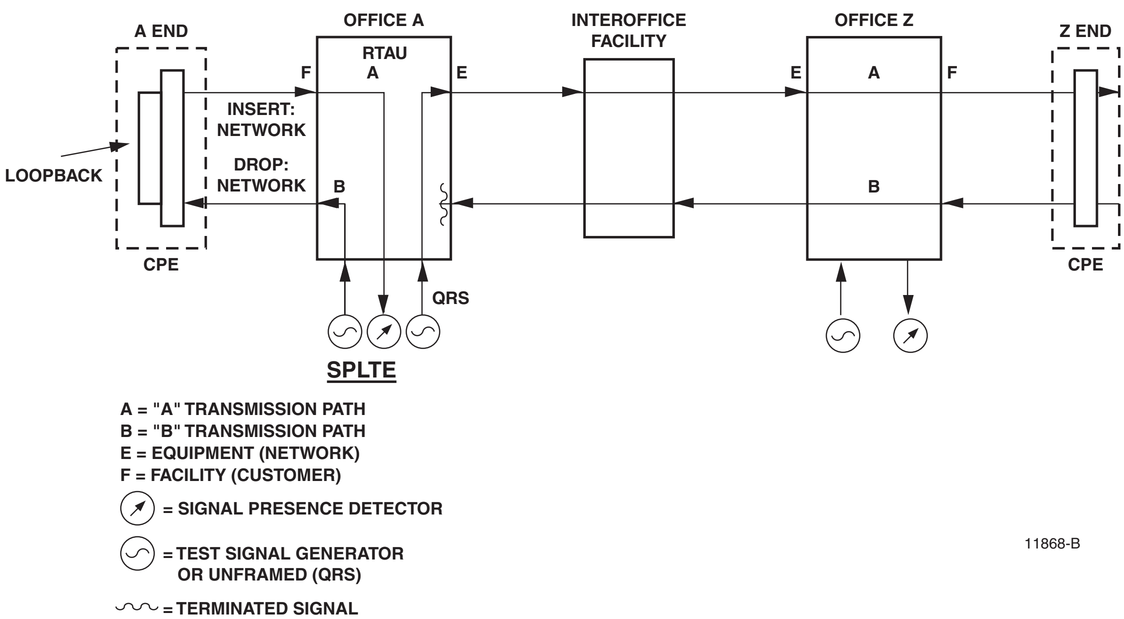

Figure 570-10. Typical End Test Configuration

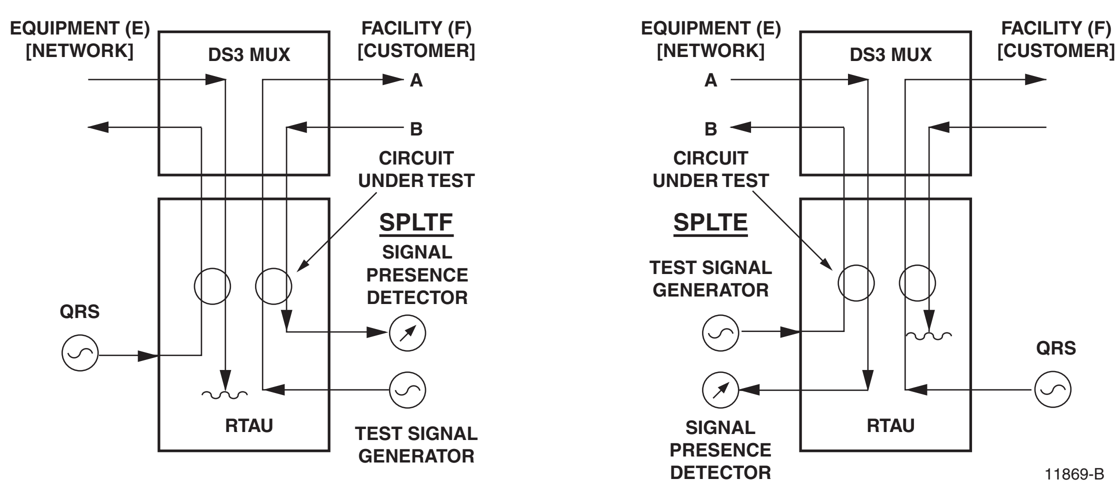

Figure 570-11. SPLTF and SLPTE

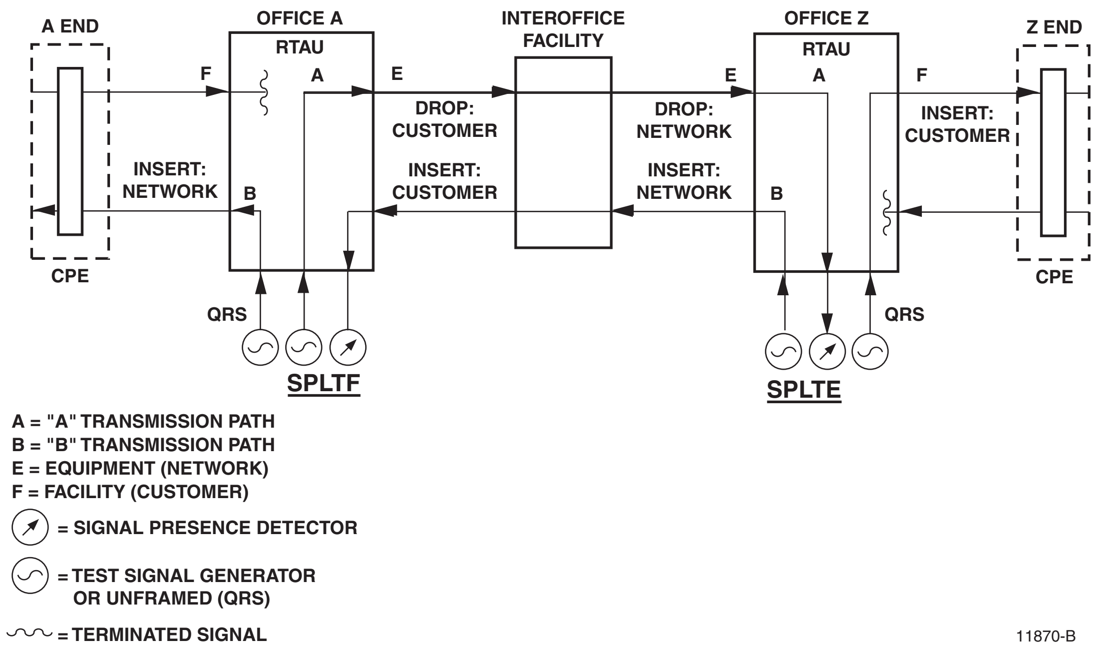

Figure 570-12. Typical Point-to-Point Test Configuration

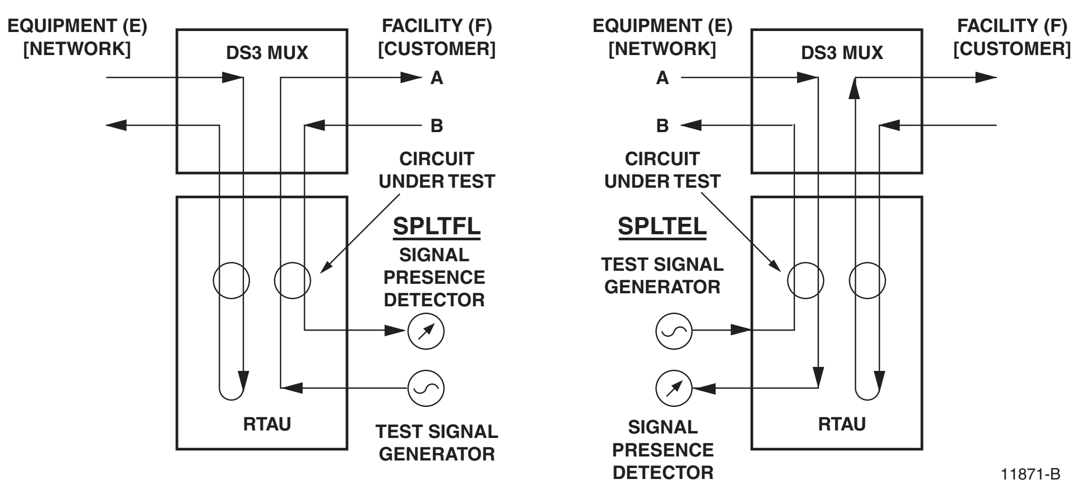

Figure 570-13. SPLTFL and SPLTEL

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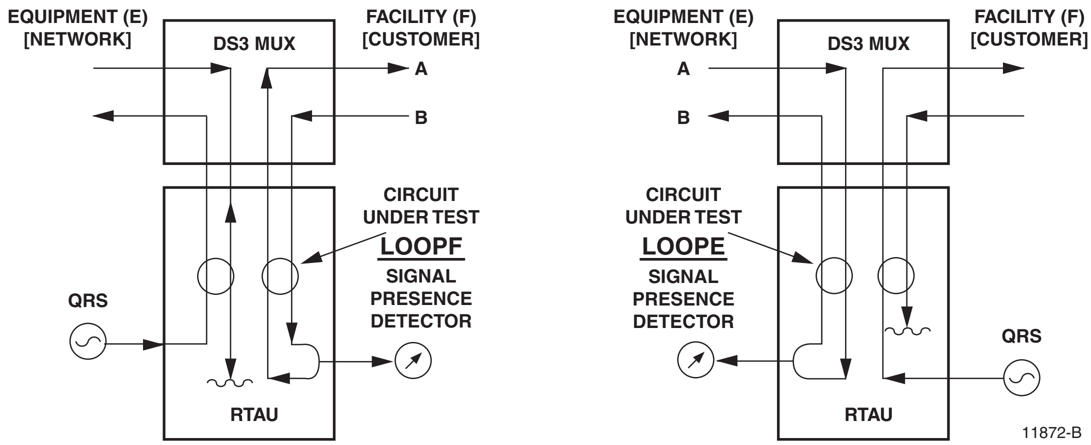

Figure 570-14. LOOPF and LOOPE

```
                              RTAU CONFIG

EQUIPMENT SETUP
===============
Current User   : CRAFT                          Test Circuit: 1-2
Line Code      : INTERNAL                       Mode        : SPLTE

SIGNAL GENERATOR SETUP
======================
Pattern Type   : EFS            -------------------------------------
Frame Format   : QRS
Loop Code      : NONE                                 ---------------

BIT ERROR SETUP          Error Counts           Status    Elapsed Time
===============          ============           ======    ============
Error Count    : 0       Data :                 F Sync:   ES :
Error Rate     : OFF     BPV  :                 P Sync:   EFS:
Error Locn     : N/A     Frame:                 RAI   :
                         CRC  :
                         COFA :

Test Timeout   : 60      Measurement   : START    WAITING ON SYNC
In Minutes
                      Press CONTROL-A For Assistance
```

14867-A

Figure 570-15. RTAU Configuration Screen (Starting a Measurement)

STREAKER INSTALLATION AND TESTING

Summary: This procedure provides instructions for installation and testing of the Streaker module.

Note: For a detailed description of Streaker (STK) module use, refer to Soneplex Streaker Module Installation Instructions, listed under Related Publications at the beginning of this manual.

Caution: *Because of the height of the battery holders, use care when sliding the module into the chassis. To prevent damage to the Streaker module or adjacent modules, insert the card straight into the chassis guides without bending or forcing the module into position.*

1. Remove the Streaker module from its protective packaging.

2. Following the polarity markings on the battery holders, install four fresh AAA alkaline batteries in the battery holders on the PC board.

3. Press the top of the voltage switch as shown in Figure 571-1 to select BATTERY (onboard) operation, or press the bottom to select –48 VOLT FEED. (Dropping resistors and a zener diode reduce the –48 VDC to approximately 6 VDC before it is applied to the indicators. In addition, the –48 VDC input line is protected by a 0.5 amp fuse on the PCB.)

4. Align the card edges of the module with the mounting slot card guides, then slide the module into a chassis slot until it contacts the backplane connector.

5. Use the ejector lever to seat the module in the connector. If difficulty is experienced when inserting or seating this module, remove the module and check that the batteries are properly seated in the holders; also check for other obstructions or misalignment in the chassis.

6. Refer to Figure 571-2. When the module is seated, press the LMP TEST (lamp test) pushbutton switch; all front panel indicators should light yellow. If the indicators do not light, check that the batteries are installed properly or (if you have selected –48V) replace the module.

Stop! You have completed this procedure.

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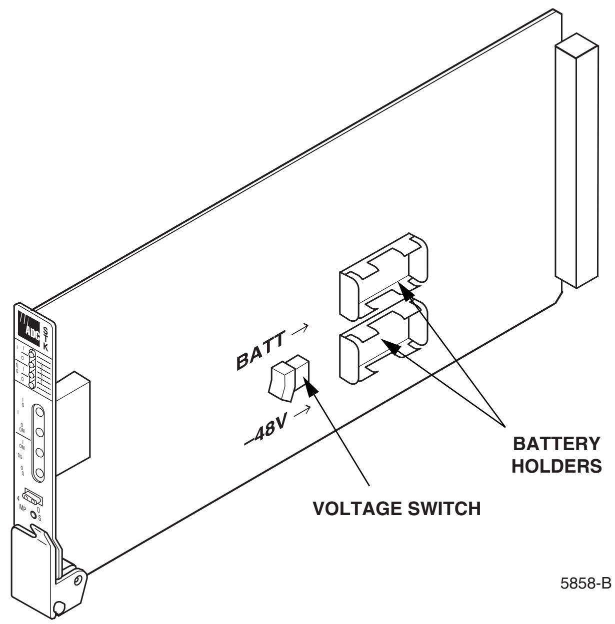

Figure 571-1. Streaker Module

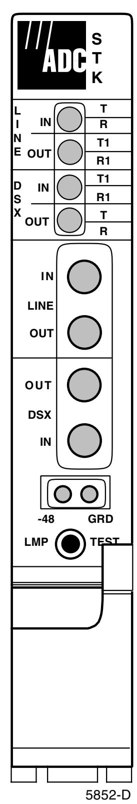

Figure 571-2. STK Front Panel

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VERSION D (OR LATER) HLXC VOLTAGE TO HLXR TEST

Summary: This procedure provides instructions for measuring DC voltage and DC current being supplied by the Version D (or later) HLXC to the Version D (or later) HLXR. The V+, V–, I+, and I– jacks provide monitor access to the voltage and current supplied to the HDSL Repeater (HRX) (if present) and HLXR through the HDSL span. Current measurements are taken as the voltage drop across a 10 ohm resistor.

Measure DC Voltage

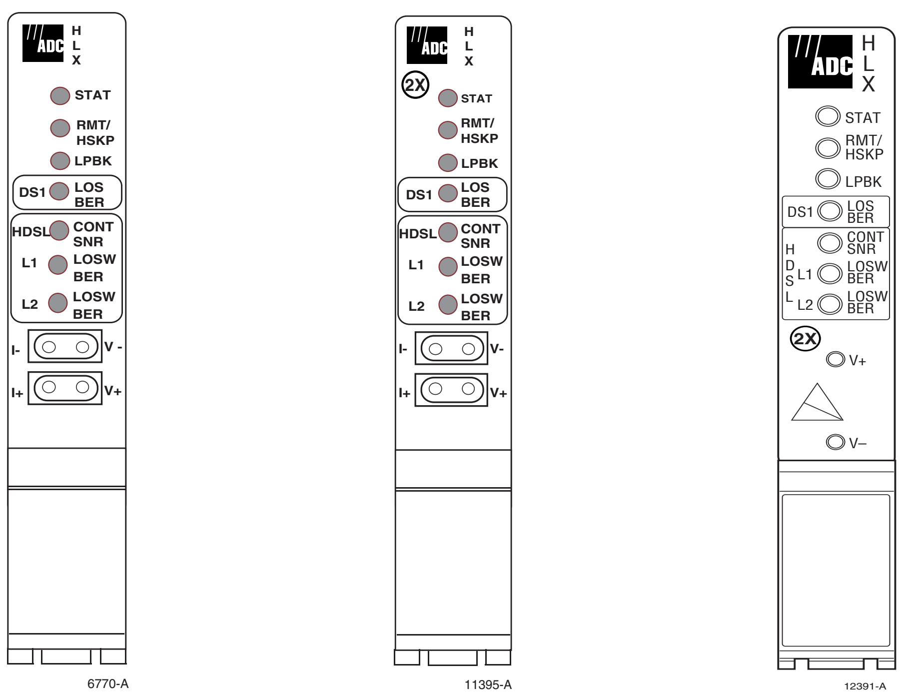
1. Select –VDC on the VOM and, if so equipped, select a voltage scale of 300 volts or higher.
2. Refer to Figure 572-1. Insert the black test probe into the V– test jack, and insert the red test probe into the V+ test jack. A typical meter reading should be approximately 130 VDC (with no HRX present), or approximately 260 VDC (with HRX present).

Measure DC Current

Note: The current test is not available on the Version G module.

3. Select –VDC on the VOM and, if so equipped, select the millivolt scale.
4. Insert the black test probe into the I– test jack, and insert the red test probe into the I+ test jack. The millivolt reading divided by 10 is the DC current in milliamps.

Stop! You have completed this procedure.



Version D HLXC **Version E HLXC** **Version G HLXC**

Figure 572-1. HLXC Module Front Panels

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HLX LOOPBACK CONFIGURATION

Summary: This procedure provides instructions for viewing or editing the loopback configuration for HLXC modules.

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful… Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Use the arrow or number keys to select Unit Configuration from the Main Menu. Press Enter or Return.

2. Use the arrow or number keys to select HLX Configuration from the Unit Configuration menu. Press Enter or Return. The HLX Configuration menu is shown in Figure 573-1.

3. Use the arrow or number keys to select Loopback Configuration from the HLX Configuration menu. Press Enter or Return. HLX Loopback Configuration screens are shown in Figure 573-2 (MPU V5.1 without an HRX), Figure 573-3 (MPU V5.1 with one HRX), and Figure 573-4 (MPU V5.2 with two HRXs).

4. Starting at the top of Table 573-1 and working your way to the bottom, configure the HLX for the group and slot selected.

5. Assign the selections by pressing Enter or Return.

6. Repeat Steps 4 and 5 for each HLX module installed in the chassis.

Stop! You have completed this procedure.

```
                 HLX CONFIGURATION


              1. HLX Unit Configuration
              2. Loopback Configuration






           Press CONTROL-A For Assistance
```

6765-A

Figure 573-1. HLX Configuration Menu

```
              HLX LOOPBACK CONFIGURATION

          Group: 6    Slot: 1    Circuit ID:


 HLXC Activation Code     :  1101001111010011
 HLXC Programmable Lpbk   :  DISABLED

 HLXR NID Loopback        :  UNIT SWITCH
 HLXR Activation Code     :  1100011101000010
 HLXR Programmable Lpbk   :  DISABLED

 HRX Activation Code      :  NOT APPL
 HRX Programmable Lpbk    :  NOT APPL

 Common Deactivate Code   :  1001001110010011
 Lpbk Timeout Disable Code:  1101010111010110
 Lpbk Timeout Period      :  30  minutes



           Press CONTROL-A For Assistance
```

6697-B

Note: “Activation Code” is equivalent to “Programmable Code.”

Figure 573-2. HLX Loopback Configuration Screen (MPU V5.1 Without an HRX)

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```
                  HLX LOOPBACK CONFIGURATION

      Group: 6    Slot: 1    Circuit ID:


   HLXC Activation Code      :  1101001111010011
   HLXC Programmable Lpbk    :  DISABLED

   HLXR NID Loopback         :  UNIT SWITCH
   HLXR Activation Code      :  1100011101000010
   HLXR Programmable Lpbk    :  DISABLED

   HRX Activation Code       :  1100011101000001
   HRX Programmable Lpbk     :  DISABLED

   Common Deactivate Code    :  1001001110010011
   Lpbk Timeout Disable Code:  1101010111010110
   Lpbk Timeout Period       :  30  minutes

   HLXR NID Loopback Switch Setting:  ENABLED



             Press CONTROL-A For Assistance
```

8113-A

Note: "Activation Code" is equivalent to "Programmable Code."

Figure 573-3. HLX Loopback Configuration Screen (MPU V5.1 With One HRX)

```
                  HLX LOOPBACK CONFIGURATION
      Group: 5    Slot: 1    Circuit ID:


   HLXC Activation Code      :  1101001111010011
   HLXC Programmable Lpbk    :  DISABLED

   ESF Inband Loopback       :  ENABLED
   HLXR NID Loopback         :  UNIT SWITCH
   HLXR Activation Code      :  1100011101000010
   HLXR Programmable Lpbk    :  DISABLED

   HRX-1 Activation Code     :  1100011101000001
   HRX-2 Activation Code     :  1100011101000010
   HRX   Programmable Lpbk   :  DISABLED

   Common Deactivate Code    :  1001001110010011
   Lpbk Timeout Disable Code:  1101010111010110
   Lpbk Timeout Period       :  30  minutes

   HLXR NID Loopback Switch Setting:  ENABLED

             Press CONTROL-A For Assistance
```

11389-A

Note: "Activation Code" is equivalent to "Programmable Code."

Figure 573-4. HLX Loopback Configuration Screen (MPU V5.2 With Two HRXs)

Table 573-1. HLX Loopback Configuration Fields

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Group	Toggle	1, 2, 3, 4, 5, 6, or 7	Specifies the module's group number designated on the chassis.	Blank
Slot	Toggle	1, 2, 3, or 4	Specifies the module's slot number designated on the chassis.	Blank
Circuit ID	Input	Up to 20 characters.	This represents the customer's circuit ID. The first and last characters must be alpha or numeric; middle characters can be alpha, numeric, or hyphens. Note: This field can be configured only after the T1 Provision field (described in DLP-531) is set to YES.	Blank
HLXC Activation Code ("Activation Code" is equivalent to "Programmable Code.")	Input	16 binary characters (0's and 1's) must be entered.	16-bit codes can be set to any 16-bit binary value except: all 0s, all 1s, or a value that is already used in another 16-bit code. The signal is sent inband. HDSL units go to loopup state when they are in armed state. Loopup is activated for selected units. Detection time is 3 secs.	1101 0011 1101 0011
HLXC Programmable Lpbk	Toggle	ENABLED	Enables response to programmable loopback codes and overrides hardware configuration settings.	**MPU V5.1:** DISABLED
		DISABLED	Disables response to programmable loopback codes and overrides hardware configuration settings.	**MPU V5.2:** ENABLED
ESF Inband Loopback	Toggle	ENABLED*	**Version E HLXC:** Enables ESF inband loopback.	**Version E HLXC:** ENABLED
		DISABLED*	**Version E HLXC:** Disables ESF inband loopback.	**Version D or earlier HLXC**: N/A
		N/A	**Version D or earlier HLXC only:** this field cannot be configured.	

* In order for the ESF Inband Loopback field to be configured, some HLX Unit Configuration screen fields must be configured as follows: Unit Equip State = EQUIPPED, Unit Service State = IS, T1 Provision = YES, TI Service State = IS, and T1 Framing Format = ESF.

(continued)

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Table 573-1. HLX Loopback Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
HLXR NID Loopback	Toggle	UNIT SWITCH	**Version E HLXR only:** Selects NID setting (enabled) for the HLXR. **Version D or earlier HLXR:** Selects NID setting (either enabled [default] or disabled) on the HLXR. When the HLXR is provisioned to function like an NID, it supports inband and out-of-band loopback codes.	**MPU V5.1:** UNIT SWITCH **MPU V5.2:** ENABLED
		ENABLED	Enables response to NID loopback codes and overrides hardware configuration settings.	
		DISABLED	Disables response to NID loopback codes and overrides hardware configuration settings.	
HLXR Activation Code (“Activation Code” is equivalent to “Programmable Code.”)	Input	16 binary characters (0’s and 1’s) must be entered.	16-bit codes can be programmed to any 16-bit binary value except: all 0s, all 1s, or a value that is already used in another 16-bit code. The signal is sent inband. HDSL units go to loopup state when they are in armed state. Loopup is activated for selected units. Detection time is 3 secs.	**MPU V5.1:** 1100 0111 0100 0010 **MPU V5.2:** 1100 0111 0101 0100
HLXR Programmable Lpbk	Toggle	ENABLED	Enables response to programmable loopback codes and overrides hardware configuration settings.	DISABLED
		DISABLED	Disables response to programmable loopback codes and overrides hardware configuration settings.	
One HRX in system only: HRX or HRX1 Activation Code (“Activation Code” is equivalent to “Programmable Code.”)	Input	16 binary characters (0’s and 1’s) must be entered.	16-bit codes can be programmed to any 16-bit binary value except: all 0s, all 1s, or a value that is already used in another 16-bit code. The signal is sent inband. HDSL units go to loopup state when they are in armed state. Loopup is activated for selected units. Detection time is 3 secs.	1100 0111 0100 0001 **No HRX:** NOT APPL

(continued)

Table 573-1. HLX Loopback Configuration Fields, continued

FIELD	TYPE	OPTIONS	DESCRIPTION	DEFAULT
Second HRX in system only: HRX2 Activation Code ("Activation Code" is equivalent to "Programmable Code.")	Input	16 binary characters (0's and 1's) must be entered.	16-bit codes can be programmed to any 16-bit binary value except: all 0s, all 1s, or a value that is already used in another 16-bit code. The signal is sent inband. HDSL units go to loopup state when they are in armed state. Loopup is activated for selected units. Detection time is 3 secs.	1100 0111 0100 0010
HRX in system only: HRX Programmable Lpbk	Toggle	ENABLED	Enables response to programmable loopback codes and overrides hardware configuration settings.	**MPU V5.1:** DISABLED
		DISABLED	Disables response to programmable loopback codes and overrides hardware configuration settings.	**MPU V5.2:** ENABLED **No HRX:** NOT APPL
Common Deactivate Code	Input	16 binary characters (0's and 1's) must be entered.	16-bit codes can be set to any 16-bit binary value except: all 0s, all 1s, or a value that is already used in another 16-bit code. The signal is sent inband. Units in loopup state go back to armed state. Detection time is 5 secs.	1001 0011 1001 0011
Lpbk Timeout Disable Code	Input	16 binary characters (0's and 1's) must be entered.	16-bit codes can be set to any 16-bit binary value except: all 0s, all 1s, or a value that is already used in another 16-bit code. This disables loopup time-out. Active loopbacks stay up until deactivation or disarm code is received. Detection time is 3 secs.	1101 0101 1101 0110
Lpbk Timeout Period	Input	Enter a number from 0 to 255	This number represents the minutes that the loopback will remain in effect before reverting to the normal (non-loopback) state. Setting the loopback time-out period to 0 (zero) disables the time-out feature.	30 minutes
HLXR NID Loopback Switch Setting	Display	ENABLED or DISABLED	This field reflects the condition of the NID enable/disable jumper wire on the HLXR edge card connector (pins 6 and 8). If no jumper wire is present between these pins, the display will show ENABLED. If a jumper wire is present between these pins, the display will shown DISABLED. If the HLXR does not have an NID jumper wire option, the display will show ENABLED.	None

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TAU INSTALLATION AND TESTING

Summary: This procedure provides instructions for installing the Test Access Unit (TAU) in the chassis and verifying that it is functioning properly. The TAU requires no provisioning or periodic maintenance.

Caution: *Modules can be damaged by electrostatic discharge (ESD). Before handling any modules, ESD protection must always be used. An ESD grounding post is located on the chassis for connecting the ESD wrist band. Ensure that all modules removed from the equipment or not installed, are properly stored in anti-static packing material. When working with modules, always place the module on an electrically-grounded, approved, anti-static mat.*

Note: For information about installing and testing the TAU, which is used with MPU Software Version 5.3, refer to the Soneplex Test Access Unit Installation Instructions manual, listed under Related Publications at the beginning of this manual.

1. Remove the TAU from its protective packaging.

2. Insert the TAU into the full height chassis slot labeled TAU (as shown in Figure 574-1) until it reaches the backplane connector.

3. Using the ejectors, fully seat the TAU in the chassis. A moderate amount of force may be required to properly seat the module in the backplane connector.

4. Did the STATUS indicator light green?
   - If Yes, you have completed this procedure.
   - If No, replace the TAU and return to Step 1.

Stop! You have completed this procedure.

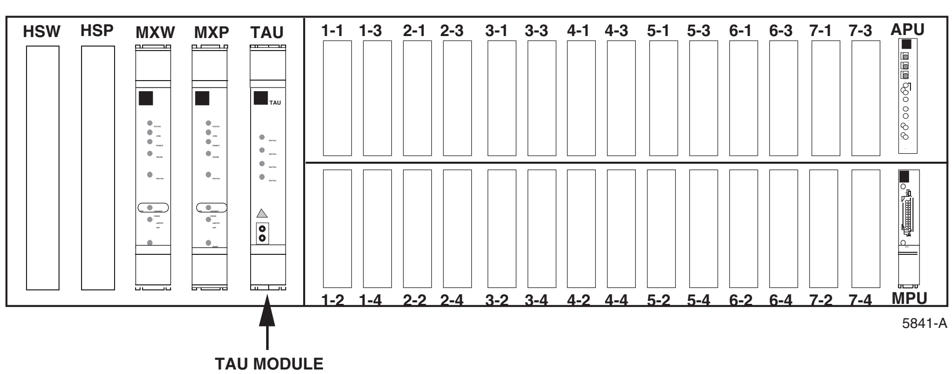

Figure 574-1. TAU Mounting Position in the Soneplex Broadband Chassis

TAU OPERATION

Summary: This procedure provides instructions for

Summary: This procedure provides instructions for operating the Test Access Unit (TAU). The TAU can be used to drop or insert DS1 signals either toward the network (DS3 interface) or the customer interface (i.e., the DS1 distribution modules) for monitoring or intrusive testing.

➧ **Note:** For information about operating the TAU, refer to the Soneplex Test Access Unit Installation Instructions manual, listed under Related Publications at the beginning of this manual.)

➧ **Note:** A "toggle" field type means the user can press the space bar to view and select the next option that is described; or the user can press the "R" key to view and select the previous option. An "input" field type means the user must type an entry in the field according to the parameters described. A "fixed" field is locked, and cannot be changed by the user.

➧ **Note:** Edits can be **made** in the configuration database in one of two ways: 1) If the complete field is highlighted, use the space bar to toggle forward or the "R" key to reverse toggle through the options for that field. 2) If only the first space or the field is highlighted, type in the data that applies to that field.

➧ **Note:** Edits to the configuration database can be **saved** after each change in one of two ways: 1) Press an arrow key and then Enter or Return **once**; or 2) Press Enter or Return **twice** after all selections and entries are made in the screen but before leaving the screen. If the entries have been accepted, a message "Configuration Successful…Press Any Key To Continue" appears on the screen.

➧ **Note:** Press CONTROL-A for help information on moving around and editing fields.

1. Refer to Figure 575-1. Check that the STATUS indicator on the front panel of the TAU module is green, indicating that the module is operating normally.

2. To drop a network or customer DS1 signal, connect a patch cord from the TX Bantam jack on the front panel of the TAU module to the monitoring equipment.

   ➧ **Note:** The DS3 MUX must be equipped to perform TAU commands.

3. Use the arrow keys to select System Maintenance from the Main Menu. Press Enter or Return.

4. Use the arrow keys to select Test Access Unit Status/Commands from the System Maintenance menu. Press Enter or Return. A Test Access Unit Status/Commands screen appears as shown in Figure 575-2. If a TAU module is installed and a Version B DS3 MUX module is in place to support it, the **TAU Present Status** field indicates YES.

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5. Determine the **Group** number (1, 2, 3, 4, 5, 6, or 7) for the DS1 signal you wish to drop/monitor. At the Group prompt, select the group number.

6. Determine the **DS1** number (1 through 4) for the DS1 signal you wish to drop/monitor. At the DS1# prompt, select the DS1 signal.

7. Use the arrow keys to move to the **Drop Direction Command** toggle field. Select 'blank field', NONE, CUSTOMER, or NETWORK. Press Enter or Return. The following confirmation message appears:

```
This Command Could Be Service Affecting...
           Are You Sure? (y/n)
```

8. Press Enter or Return, then observe the indications on the monitoring equipment.

   Note: The **Drop Direction Status** field displays NONE (the default), CUSTOMER, or NETWORK.

9. To drop other DS1 signals, repeat Steps 1 through 8, making different selections in Steps 5 (Group) and 6 (DS1 Number).

   Note: All possible DS1 Drop and Insert configurations using the TAU module are illustrated in Figure 575-3 for reference.

   Note: The Intrusive Test indicator on the front panel of the TAU module will light red during any intrusive (Insert) tests.

   Note: Press the TAU's Line Code pushbutton switch as necessary to select either B8ZS (which lights the B8ZS indicator) or AMI for the DS1 bipolar interface.

10. To insert a Network or Customer DS1 signal:

    a) Perform Steps 1 through 6.

    b) Patch the front panel RX jack to the TX jack.

    c) Move to the **Insert Direction Command** field on the screen. Select 'blank field', NONE, CUSTOMER, or NETWORK. Press Enter or Return.

11. To insert an external DS1 signal:

    a) Perform Steps 1 through 6.

    b) Patch the external test equipment to the RX jack.

    c) Move to the **Insert Direction Command** field on the screen. Select 'blank field', NONE, CUSTOMER, or NETWORK. Press Enter or Return.

12. When you are finished using the TAU module, change the **Drop Direction Command** and **Insert Direction Command** fields to NONE, then disconnect any patch cords from the front panel RX and TX jacks.

Stop! You have completed this procedure.

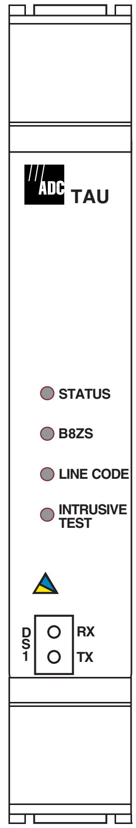

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Figure 575-1. TAU Module Front Panel

```
                TEST ACCESS UNIT STATUS/COMMANDS

                   Group: 1          DS1#: 1

                Drop Direction    Insert Direction
                ==============    ================

    Status  :     NONE               NONE

    Command :


                    TAU Present Status: YES




                Press CONTROL-A For Assistance
```

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Figure 575-2. Test Access Unit Status/Commands Screen

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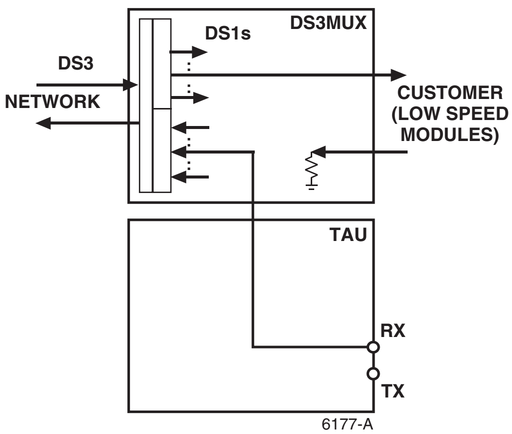

Figure 575-3a. Drop: None/Insert: Network

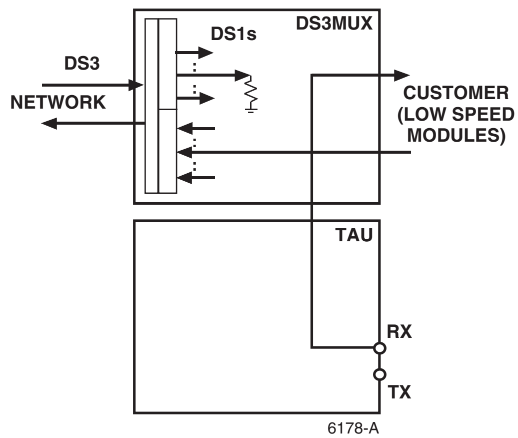

Figure 575-3b. Drop: None/Insert: Customer

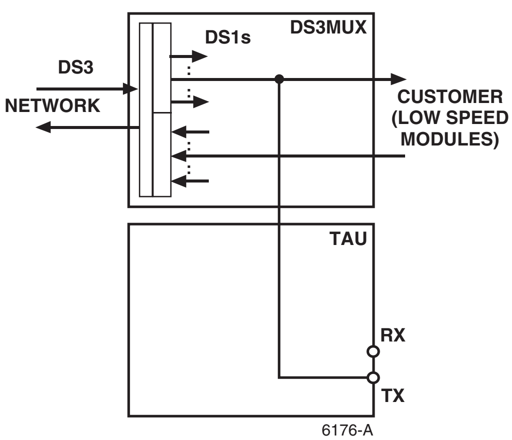

Figure 575-3c. Drop: Network/Insert: None

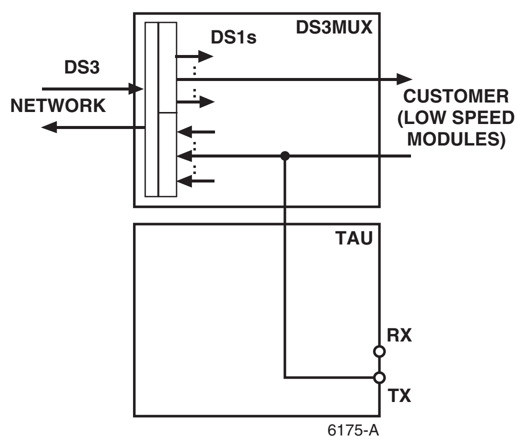

Figure 575-3d. Drop: Customer/Insert: None

Figure 575-3. TAU Drop/Insert Configurations

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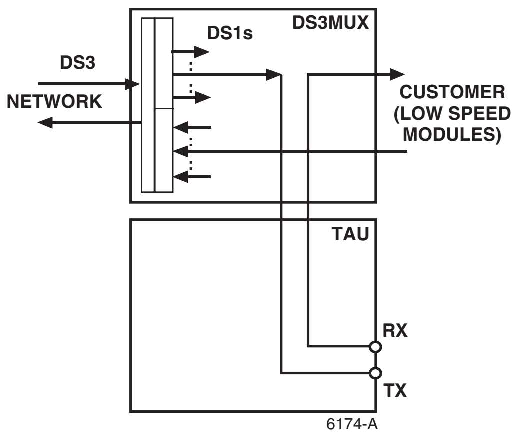

Figure 575-3e. Drop: Network / Insert: Customer

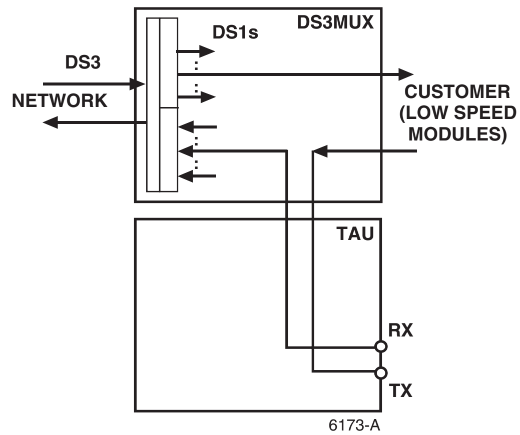

Figure 575-3f. Drop: Customer / Insert: Network

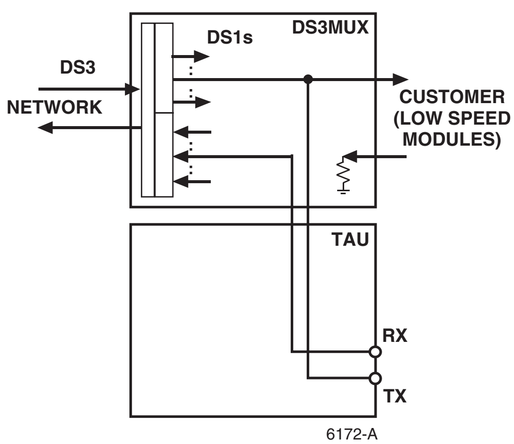

Figure 575-3g. Drop: Network / Insert: Network

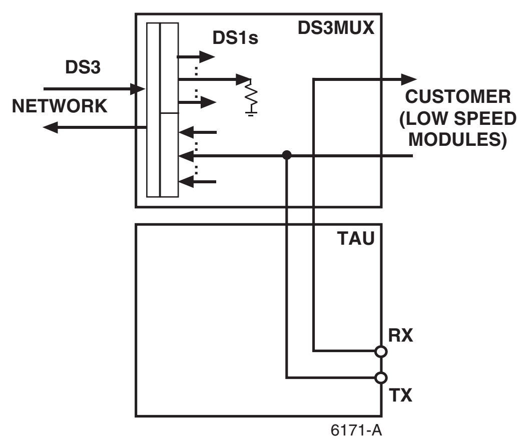

Figure 575-3h. Drop: Customer / Insert: Customer

Figure 575-3. TAU Drop/Insert Configurations, continued

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TBOS CHASSIS DAISY-CHAINING

Summary: This procedure provides instructions for daisy-chaining one TBOS link to several chassis configured for compressed TBOS. Up to four chassis can be connected in this manner.

1) Assign a different address in the range 0 through 7 to each of the compressed displays available on the link.

   Reference: DLP-549 Serial Port Configuration

2) Make sure each chassis in the chain has an MPU installed.

   Reference: DLP-502 MPU Installation and Testing

   Reference: DLP-519 MPU Replacement and Testing

3) Remove the termination strap from the Berg jumper pins labeled "JD 13" from each MPU's PC board **except** the last one in the chain, as shown in Figure 576-1.

4) Make connections between chassis: from each Port 1 Tx– to Tx–; from each Port 1 Tx+ to Tx+; from each Port 1 Rx– to Rx–; and from each Port 1 Rx+ to Rx+, as shown in Figure 576-2. Refer to the Soneplex Broadband System Chassis Installation Manual, listed under Related Publications at the beginning of this manual, for wiring instructions.

Stop! You have completed this procedure.

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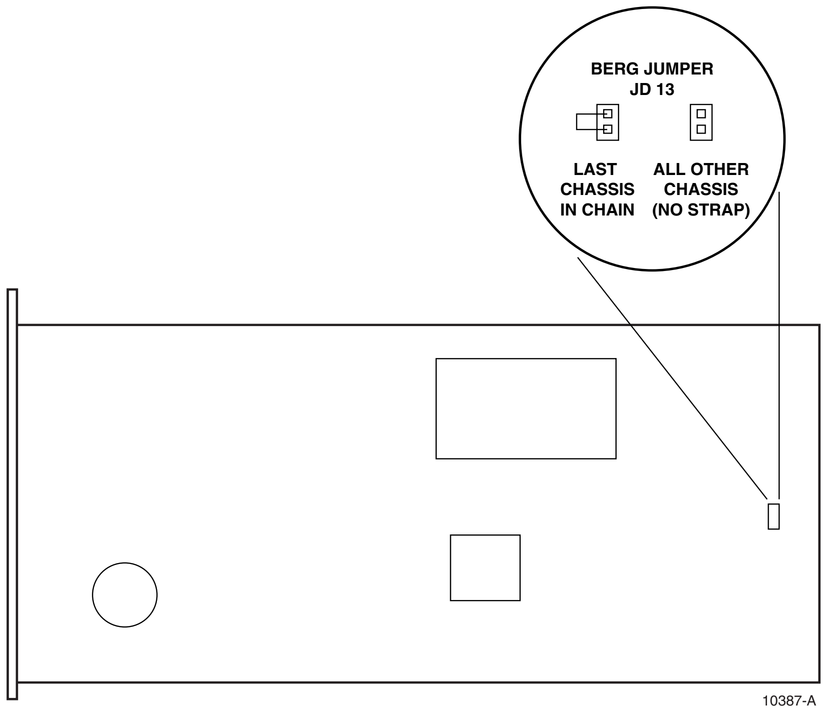

Note: The default setting is “strapped”.

Figure 576-1. Berg Jumper Configuration on MPU for TBOS Linking

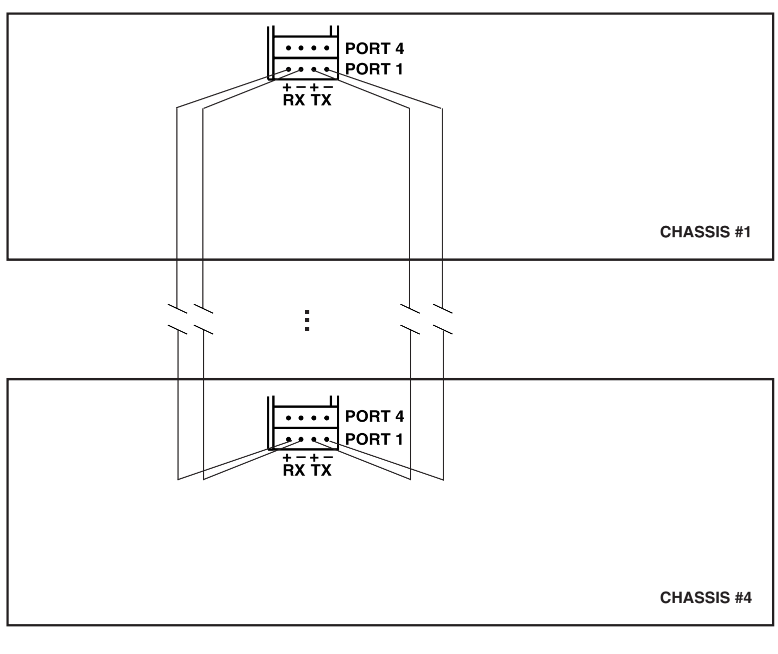

Figure 576-2. Daisy-Chaining Chassis for TBOS Linking

MAINTENANCE PHILOSOPHY

Summary: Soneplex maintenance philosophy is built on the collection of system information through inspection of the Soneplex modules themselves, and through software interfaces. Central office (near-end) alarms are displayed on the modules in the chassis. Remote (far-end) alarms are displayed on the corresponding near-end modules by pressing the DISP RMT switch on the APU. Alarm information is also gathered through a software interface such as Craft, TL1 or TBOS.

Trouble Analysis Procedures

Trouble analysis procedures found in this document involve replacing faulty modules and obtaining alarm and status reports. Status and alarm reports are then analyzed to determine proper system operation and locate trouble.

Module Failures

APU, DLX, DS3 MUX, HLXC, MPU, ODS2, and RLX module failures are identified by status indicators and reported by system alarms. The first step in analyzing a module failure is to look for a red status LED indicator on the module. If operating the system through the Craft Interface, display the Active Alarms screen, and look for modules with a COMM FAIL or BOARD FAIL condition. Push the Reset switch on the module in question or perform a module reset through the Craft Interface. If these actions fail to restart the module, unplug and reseat the module in question. Reseating the module can correct a contact problem and avoid the return of a good module for repair. Use caution when unplugging modules, ensuring that protection switching is available for the module being removed.

Electrostatic Discharge (ESD) Protection Considerations

Modules can be damaged by static electricity that builds up in work areas, especially in areas with low relative humidity. The static buildup in work areas (on work surfaces, people, and clothing) is produced by the rubbing of objects together to produce an electrical charge.

Caution: *Electronic modules can be damaged by electrostatic discharge (ESD). Before handling modules, wear an anti-static discharge wrist strap to prevent damage to electronic components. Place modules in anti-static packing material when transporting or storing. When working on modules, always place them on an approved anti-static mat that is electrically grounded.*

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All personnel handling modules should take the following precautions.

1. Keep materials that tend to generate static electricity such as plastics, nylon clothing, and Styrofoam containers away from all modules.

2. Read all caution and warning labels on bags and shipping cartons before opening any package.

3. Open all modules, using properly grounded wrist straps and table mats designed to dissipate static electricity.

4. Soneplex chassis are equipped with a grounding jack for connecting anti-static ground wrist straps. The jack is located in the front on the right side of the chassis.

5. If possible, wait to remove modules from their protective anti-static packaging until it is time to install them into a chassis.

6. Never touch module components or connector pins. Handle all modules only by the front plate, extractor, or by the card edges.

7. Ensure that all modules removed from the chassis or not installed, are properly stored in anti-static packing material.

SPECIFICATIONS

Summary: This TAD shows technical specifications for the Soneplex Broadband system with MPU Version 5 software in Table 101-1 (System Specifications), Table 101-2 (DS3 MUX Power), Table 101-3 (DLX Power), Table 101-4 (C1 HLXC Power), Table 101-5 (Version D and E HLXC Power), Table 101-6 (ODS2 Power), Table 101-7 (A2 RLX Power), and Table 101-8 (Version B RLX / RLXIOR Power).

Table 101-1. Soneplex Broadband System (V5) Specifications

PARAMETER	SPECIFICATION	REMARKS
Dimensions		
Chassis (H × W × D)	10 × 21.5 × 12 inches (25.4 × 54.6 × 30.5 cm)	
Environment		
Operating Relative Humidity	5% to 95%	No condensation
Operating Temperature	–40°F to 149°F (–40°C to 65°C)	
Storage Temperature	–40°F to 158°F (–40°C to 70°C)	
Power		
Input Voltage Range	–42.5 to –56.5 VDC	A and B feed
Consumption (–48 VDC): APU	 7.5 watts maximum	
MPU	5 watts maximum	
DS3 MUX	See Table 101-2	Per module
DLX	See Table 101-3	Per module
C1 HLXC	See Table 101-4	
Version D and later HLXCs	See Table 101-5	
B1 HLXR	9.9 watts 8.3 watts	Simplex current enabled Simplex current disabled
Version D and later HLXRs, HLXR 3192	9 watts	Simplex power enabled (D1, D2, D2A-SP, D3, D3A, D3B HLXRs only)
	4 watts	Simplex power disabled (D2A, D4, D4A, D4B, and Version E HLXRs; and HLXR 3192 only)
ODS2	See Table 101-6	
A2 RLX	See Table 101-7	
Version B RLX / RLXIOR	See Table 101-8	
TAU	2 watts maximum	
RTAU	8.2 watts maximum	
Maximum Power	Determined by configuration	

(continued)

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Table 101-1. Soneplex Broadband System (V5) Specifications, continued

PARAMETER	SPECIFICATION	REMARKS
DS3 Interface (DS3 MUX)		
DS3 Input Level	+5.7 dBm to –7.3 dBm	
DS3 Transmit Power Level	–1.8 to +5.7 dBm	
Format	Bipolar, Return to Zero	
Impedance	75 ohms (nominal)	With splitter/combiner
Line Code	B3ZS	
Line Rate	44.736 Mbps ± 20 ppm	
Maximum Span	450 ft. to cross-connect facility	
DS3 Interface (D1 DS3 MUX)		
DS3 Input Level	+5.7 dBm to –7.4 dBm	
DS3 Transmit Power Level	–1.8 to +5.7 dBm	
Format	Bipolar, Return to Zero	
Impedance	75 ohms nominal	With splitter/combiner
Line Code	B3ZS	
Line Rate	44.736 MHz ± 20 ppm	
Maximum Span	450 ft. to cross-connect facility	
DLX Module		
Format	Bipolar, Return to Zero	Transparent to frame format
Input Impedance	100 ohms ± 5%	
Input Signal Level	0 to –10 dB	
Line Code	AMI or B8ZS	
Line Rate	Standard DS1 code at 1.544 Mbps ± 200 bps (130 ppm)	
Output Pulse	Per GR-499-CORE, Issue 4	22 AWG ABAM
Output Signal Level	0 dB	
C1 HLXC Module		
Loop Loss	<35 dB @ 196 kHz	135 ohm termination
Loop Types	Two-pair, single or mixed gauges	With or without bridged taps
Transmission:		
Format	Two 784 kbps full duplex pairs, 2B1Q modulation	
Line Impedance	135 ohms nominal	Balanced
Loop Power Output Voltage	–132 ± 5 VDC	
Return Loss	>20 dB	40 kHz to 200 kHz
Total Signal Power	+13.5 dBm ± 0.5 dBm	

(continued)

Table 101-1. Soneplex Broadband System (V5) Specifications, continued

PARAMETER	SPECIFICATION	REMARKS
Version D and later HLXC Modules		
Loop Loss	< 35 dB @ 196 kHz	135 ohm termination
Loop Types	Two-pair, single or mixed gauges	With or without bridged taps
Transmission: Format	Two 784 kbps full duplex pairs, 2B1Q modulation	
Line Impedance	135 ohms nominal	Balanced
Loop Power Output Voltage	–132 ± 5 VDC (without HRX) ±130 VDC (with HRX)	
Return Loss	>20 dB	40 kHz to 200 kHz
Total Signal Power	+13.5 dBm ± 0.5 dBm	
B1 HLXR		
DS1 Interface: Input / Output Signals	Per ANSI T1-403	
Frequency	1.544 Mbps	
HDSL Interface: Format	Two 784 kbps full duplex pairs, 2B1Q	
Impedance	135 ohms	
Loop Loss	<35 dB	196 kHz
Loop Type	Two pair, single or mixed gauges	With or without bridged taps
Output Signal Level	+13.5 dBm	
Return Loss	>20 dB	40 to 200 kHz
Power	–42 to –56 VDC (local) –85 to –130 VDC (line)	

(continued)

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Table 101-1. Soneplex Broadband System (V5) Specifications, continued

PARAMETER	SPECIFICATION	REMARKS
Version D and later HLXRs; HLXR 3192		
DS1 Interface: Input / Output Signals	Per ANSI T1-403	
Frequency	1.544 Mbps	HLXR 3192 only: ±200 bps received signal tolerance; ±50 bps generated signals
HDSL Interface: Format	Two 784 kbps full duplex pairs	2B1Q
Impedance	135 ohms	
Loop Loss	<35 dB	196 kHz
Loop Type	Two pair, single or mixed gauges	With or without bridged taps
Output Signal Level	+13.5 dBm	
Return Loss	>20 dB	40 to 200 kHz
Power	–42.5 to –56.5 VDC (local)	Version D HLXR only
	–130 VDC or ±130 VDC (line)	Constant voltage differential between loops 1 and 2 can vary from 42 VDC to 260 VDC
Version A and Version B HRXs		
Impedance	135 ohms	
Input Voltage	Up to ±130 VDC nominal	
Loop Loss Allowed	Up to 35 dB	HLXC to HRX, first HRX to second HRX, and HRX to HLXR
Output Signal Level	13.5 ±0.5 dBm	
Power Consumption	6.2 watts (max. per repeater)	All power dissipated in the unit.
ODS2 Module		
Fiber Cable	9/125 µm single mode	Nominal
Line Rate	6.312 Mbps ± 20 ppm	
Number of Fibers	Two single mode	Per ODS2 module
Operating Wavelength	1300 nm ± 40 nm	
Optical Budget	22.0 dB (minimum)	
Optical Connector	FC or SC type (Tx/Rx)	
Optical Transmit Power	–7 dBm ± 2 dB	Average power
Receive Device	PIN Photodiode	
Receiver Dynamic Range	–5 to –31 dBm @10^{-9} BER	
Transmit Device	Laser	

(continued)

Table 101-1. Soneplex Broadband System (V5) Specifications, continued

PARAMETER	SPECIFICATION	REMARKS
A2 RLX Module		
Frame Format	SF, ESF, SLC96, and unframed	
Frequency	1.544 Mbps ± 200 bps (130 ppm)	
Input Signal Level	0 dB to –33 dB	Clock recovery range for loop timing.
Line Code	AMI or B8ZS	
Output Line Buildout Settings	0.0, 7.5, 15.0, and 22.5 dB	
Output Signal Range	Up to 3,000 feet (914.4 meters)	Up to 6,000 feet (1,828.8 meters) with ideal cable conditions.
Span Power	60 mA, –140 VDC max.	Up to 7 or 14 watts
Version B RLX / RLXIOR Modules		
Frame Format	SF, ESF, SLC96 and unframed	
Frequency	1.544 Mbps ± 130 ppm	
Input Signal Level	0 dB to –33 dB	Clock recovery range for loop timing
Line Code	AMI or B8ZS	
Output Signal LBO Settings	0.0, 7.5, 15.0 and 22.5 dB	
Output Signal Range	Up to 3,000 feet (914.4 meters) over 22 AWG wire	Up to 6,000 feet (1,828.8 meters) depending on cable characteristics
Span Power	60 mA, ±140 VDC maximum	Up to 8 or 16 watts
Streaker Module		
Internal Batteries	4 AAA 1.5 volt (6 VDC)	Mounted on PCB
Jack Type	Bantam	
System Input Voltage Range	–42.5 to –56.5 VDC –48 VDC nominal	
TAU Module		
DS1 Jack Access Jack Type	Bantam	
Electrical Interface	Bipolar	
Impedance	100 ohms nominal	
Line Code	AMI or B8ZS	Controlled by front panel switch
Line Rate	1.544 Mbps ± 130 ppm max.	

(continued)

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Table 101-1. Soneplex Broadband System (V5) Specifications, continued

PARAMETER	SPECIFICATION	REMARKS
RTAU Module		
DS1 Jack Access Jack Type	Bantam	
Electrical Interface	Bipolar	
Impedance	100 ohms nominal ± 5%	
Line Code	AMI or B8ZS	Controlled by front panel switch
Line Rate	1.544 Mbps ± 130 ppm max.	
Interface Connections		
Alarm	0.045 inch wire wrap post	
Optical DS2	FC or SC	Per catalog number.
DS3 Input	75 ohm BNC	
HDSL/DS1	0.045 inch wire wrap post	
MPU (Front Port)		
Craft Interface	DB-25 D subminiature	Craft, TL1 (EIA-232)
Serial Ports		
Port 1	0.045 inch wire wrap post	TBOS (EIA-422)
Port 2	DB-25 D subminiature	TBOS, Craft, TL1 (EIA-232)
Port 3	DB-25 D subminiature	Craft, TL1, TL1 (X.25) (EIA-232)

Table 101-2. DS3 MUX Power Characteristics

MAX. POWER CONSUMPTION/DISSIPATION	MAX. CURRENT DRAIN (AT –48 VDC)
8 watts	166 mA

Note: Two DS3 MUXs (one working and one protect) are used per chassis in Broadband (V5) applications.

Table 101-3. Broadband (V5) Power Characteristics with DLX

NO. OF DLXS IN CHASSIS	MAX. POWER CONSUMPTION/DISSIPATION	MAX. CURRENT DRAIN (AT –48 VDC)
1	2 watts	41 mA
28	84 watts	1.8 amps

Note: Power characteristics for fully configured chassis include common equipment: APU (7.5 watts), MPU (5 watts), and two DS3 MUX modules (8 watts each), for a total of 28 watts.

Table 101-4. Broadband Power Characteristics with C1 HLXC

HLXR CONFIGURATION	NO. OF C1 HLXCS IN CHASSIS	MAX. POWER CONSUMPTION	MAX. POWER DISSIPATION	MAX. CURRENT DRAIN (AT –48 VDC)
Span Powered B1 HLXR with DS1 Simplex Disabled	1	22.7 watts	11.9 watts	473 mA
	28	664 watts	361 watts	13.8 amps
Span Powered B1 HLXR with DS1 Simplex Enabled	1	28.2 watts	12.4 watts	587 mA
	28	818 watts	375 watts	17 amps
Local Powered B1 HLXR	1	8.9 watts	8.9 watts	248 mA
	28	277 watts	277 watts	5.8 amps

Note: Power characteristics for fully configured chassis include common equipment: APU (7.5 watts), MPU (5 watts), and two DS3 MUX modules (8 watts each), for a total of 28 watts.

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Table 101-5. Broadband Power Characteristics Version D and later HLXCs

HLXR CONFIGURATION	# OF HRXS IN SYSTEM	# OF HLXCS IN CHASSIS	MAX. POWER CONSUMPTION	MAX. POWER DISSIPATION	MAX. CURRENT DRAIN (AT –48 VDC)
Span Power ON; DS1 simplex disabled; D2A, D4, D4A, D4B, Version E HLXRs	0	1	10.5 watts	6.5 watts	219 mA
		28	322 watts	210 watts	6.7 amps
	1	1	21.5 watts	8.5 watts	448 mA
		28	630 watts	266 watts	13.1 amps
	2 (Version E HLXR only)	1	25.5 watts	8.5 watts	531 mA
		28	742 watts	266 watts	15.4 amps
Span Power ON; DS1 simplex enabled; D1, D2, D2A-SP, D3, D3A, D3B HLXRs	0	1	19.0 watts	7.5 watts	396 mA
		28	560 watts	238 watts	11.7 amps
	1	1	28.0 watts	9.5 watts	583 mA
		28	812 watts	294 watts	16.9 amps
Span Power ON; Local power at remote; D1 HLXR	0	1	5.5 watts	5.5 watts	115 mA
		28	182 watts	182 watts	3.8 amps
	1	1	14.0 watts	7.0 watts	292 mA
		28	420 watts	224 watts	8.8 amps
Span Power OFF; Local power at remote; D1 HLXR	0	1	5.5 watts	5.5 watts	115 mA
		28	182 watts	182 watts	3.8 amps
	1	No power values because HRXs require span power.			

Note: Power values for a fully configured chassis (28 HLXCs) include the power of the common equipment: APU (7.5 watts), MPU (5 watts), and two DS3 MUX modules (8 watts each), for a total of 28 watts.

Table 101-6. Broadband (V5) Power Characteristics with ODS2 Modules

NO. OF ODS2S IN CHASSIS	MAX. POWER CONSUMPTION/DISSIPATION	MAX. CURRENT DRAIN (AT –48 VDC)
1	4 watts	83 mA
14	84 watts	1.8 amps

Note: Power characteristics for fully configured chassis include common equipment: APU (7.5 watts), MPU (5 watts), and two DS3 MUX modules (8 watts each), for a total of 28 watts.

Table 101-7. Broadband Power Characteristics with A2 RLX

A2 RLX CONFIGURATION	NO. OF A2 RLXS IN CHASSIS	MAX. POWER CONSUMPTION	MAX. POWER DISSIPATION	MAX. CURRENT DRAIN (AT –48 VDC)
With Span Power	1	12.6 watts	4.1 watts	262 mA
	28	381 watts	143 watts	7.9 amps
Without Span Power	1	2.4 watts	2.4 watts	50 mA
	28	95 watts	95 watts	2.0 amps

Note: Power characteristics for fully configured chassis include common equipment: APU (7.5 watts), MPU (5 watts), and two DS3 MUX modules (8 watts each), for a total of 28 watts.

Note**:** If a T1 repeater is powered by the RLX, Broadband power characteristics will change depending on the power consumption of the T1 repeater. The A2 RLX's maximum span power is 8 watts.

Table 101-8. Broadband Power Characteristics with Version B RLX / RLXIOR

VERSION B RLX CONFIGURATION	NO. OF RLXS IN CHASSIS	MAX. POWER CONSUMPTION	MAX. POWER DISSIPATION	MAX. CURRENT DRAIN (AT –48 VDC)
With Span Power, –130 VDC	1	13.4 watts	5.0 watts	279 mA
	28	403 watts	168 watts	8.4 amps
With Span Power, ±130 VDC	1	23.4 watts	6.6 watts	487 mA
	28	683 watts	213 watts	14.2 amps
Without Span Power	1	2.7 watts	2.7 watts	57 mA
	28	104 watts	104 watts	2.2 amps

Note: Power characteristics for fully configured chassis include common equipment: APU (7.5 watts), MPU (5 watts), and two DS3 MUX modules (8 watts each), for a total of 28 watts.

Note: If a T1 repeater is powered by the RLX, Broadband power characteristics will change depending on the power consumption of the T1 repeater. The Version B RLX / RLXIOR's maximum span power is 8 watts at –130 VDC, and 16 watts at ±130 VDC.

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LOOPBACK PROCESS DESCRIPTION

Summary: The HDSL loopback process is similar to other T1 intelligent repeater methods. For Version D and later HLX modules, the HLXC loopback is like an intelligent office repeater loopback. The HLXR loopback and HRX loopback are like an intelligent inline T1 repeater loopback.

The HDSL loopback operation is described by the diagram in Figure 102-1. The four states are:

- Disarmed
- Armed
- Loopup
- Loopup/Time-Out Disable

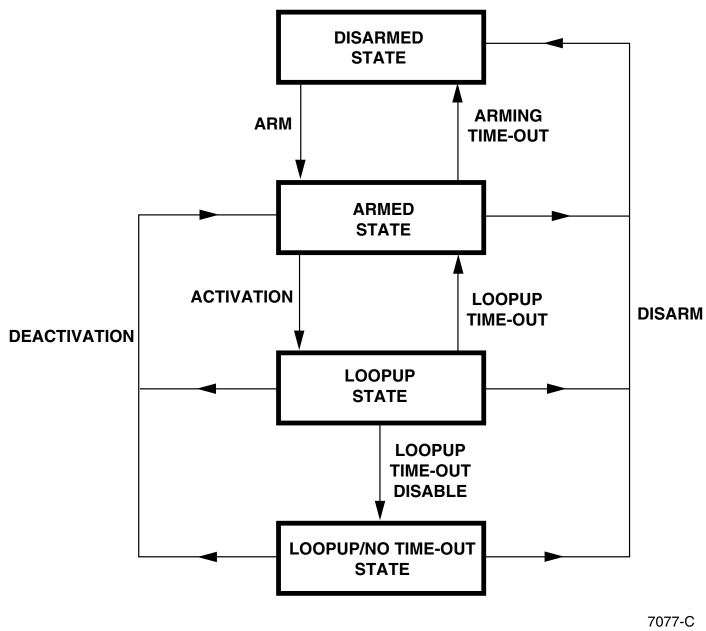

Figure 102-1. Loopback Operation State Diagram

Inband and ESF data link sequences and time-out operations produce the state transitions. These sequences and time-out values are:

- Arming sequence (inband or ESF data link)
- Activation sequence
- Deactivation sequence
- Disarming sequence (inband or ESF data link)
- Loopup time-out
- Arming time-out

The inband control code sequences will be recognized either in DS1 framed format (SF or ESF framing) or in unframed format.

Table 102-1 contains a summary of loopback time-out and control codes. Notice that in the Default Code column, the inband codes are shown left bit transmitted first and the ESF data link codes are shown with the right bit transmitted first.

Table 102-1. HDSL Loopback Time-Out and Control Default Codes

NAME	DEFAULT CODE	DETECTION TIME	COMMENTS
Arming (inband) Arming (ESF)	11000 0001 0010 1111 1111	> 5 seconds 4 repetitions	The signal is sent inband or over ESF data link. HDSL units in disarmed state make the transition to armed state. When the inband arming code is detected, the smartjack loopup state activates.
Activation (HLXC) Activation (HRX) Activation (HLXR)	1101 0011 1101 0011 1100 0111 0100 0001 1100 0111 0100 0010	> 3 seconds > 3 seconds > 3 seconds	The signal is sent inband. HDSL units go to loopup state when they are in armed state. Loopup is activated for selected units.
Deactivation (all HDSL units)	1001 0011 1001 0011	> 5 seconds	The signal is sent inband. Units in loopup state go back to armed state.
Loopup time-out disable	1101 0101 1101 0110	> 3 seconds	Disable loopup time-out. Active loopbacks stay up until deactivation or disarm code is received.
Disarming (inband) Disarming (ESF)	11100 0010 0100 1111 1111	> 5 seconds 4 repetitions	The signal is sent inband or over ESF data link. HDSL units are disarmed.
Arming time-out	n/a	2 hours	An armed HDSL unit goes to disarmed state.
Loopup time-out	n/a	Programmable from Version D HLXC	An HDSL unit in loopup goes to armed state.

Note: All codes are programmable.

Disarmed State

The normal operation mode is the disarmed state. Although each HDSL unit is transparent to the data flow, each monitors the inband data flow and the ESF data link for the arming sequence. The CPE smartjack loopup inband control code sequence arms the loopback capability of all HDSL units at the same time. Each HDSL unit arms when the arm sequence code has been received for five seconds.

The HDSL unit detects the unit arming and smartjack loopup sequence without disturbing the detection by the smartjack (the smartjack loopup response needs a minimum of five seconds). The arming sequence requires that the smartjack does the loopup and all HDSL units go from the disarmed state into the armed state. No other control code sequences are detected while in the disarmed state.

The ESF data link sequence that arms the loopback capability of all HDSL units at the same time is the standard 16-bit ESF data link sequence used for CPE smartjack loopup. The ESF arm sequence is repeated four times.

➧ **Note**: If the HLXR is provisioned as NID-enabled, then the arming sequence will cause the HLXR to loop back in response to this NID (i.e. smartjack) loop-up code.

In the same manner as described above for the inband code, the HDSL unit detects the unit arming and smartjack loopup sequence without disturbing the detection by the smartjack. For example, the ESF arm sequence causes the smartjack to loopup and all HDSL units move from the disarmed state into the armed state. No other ESF data link control code sequences are detected in the disarmed state.

➧ **Note**: If the HLXR is provisioned as NID-enabled, then the arming sequence will cause the HLXR to loop back in response to this NID (i.e. smartjack) loop-up code.

Armed State

The HDSL unit continues to be transparent to data flow in the armed state. However, the units monitor the inband data flow for activation and disarming sequences and the ESF data link for the disarming sequence.

➧ **Note**: The ESF data link does not directly command a loopup of the HDSL units.

A unit returns to the disarmed state after an arming time-out occurs, or a disarm code is received.

Transition from Armed to Loopup State

A specific HDSL unit moves from the armed state into the loopup state when commanded by an inband control code sequence. There is a unique 16-bit activation control code sequence for each HDSL unit as shown previously in Table 102-1.

As part of the loopup activation process, each of the HDSL units will respond with a loopup identification signature that consists of a burst of bit errors in the looped payload. Upon receiving three or more seconds of the specific activation code sequence, the addressed HDSL unit will respond as follows:

- Loopback of the received payload data for five seconds.
- A burst of bit errors in the looped payload.
- Continued loopback of the received payload.

The number of bit errors returned in this loopup identification signature is specific to each HDSL unit as follows:

- HLXC – 231 bit errors
- HRX – 10 bit errors
- HLXR – 20 bit errors

Note: The bit errors inserted for the loopup identification signature may occur in the frame bit position as well as the payload in a looped SF or ESF framed data signal.

Transition from Armed to Disarmed State

The standard 5-bit inband disarming sequence used for CPE smartjack loopdown is a command for all HDSL units to go from the armed state into the disarmed state. Each HDSL unit disarms after receiving the command for five seconds.

The ESF data link disarming sequence used for CPE smartjack loopdown is a command for all HDSL units to go from the armed state into the disarmed state. The ESF disarm sequence is repeated four times.

All HDSL units go from the armed state into the disarmed state when the default time-out value of two hours is reached.

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Loopup State

The selected HDSL unit provides continuous loopup of the DS1 signal in the loopup state. At the same time, the data flow is monitored for the inband deactivation sequence, the inband disarming sequence, and the ESF data link disarming sequence. A loopup time-out event forces a return to the armed state. No other control code sequences are detected in the loopup state.

Transition from Loopup State to Loopup/No Time-out State

A single inband 16-bit control code commands all HDSL units to go from the loopup state to the loopup/no time-out state. This loopup time-out disable code must be received for at least three seconds.

When a unit is in the Loopup/No Time-out State, the loopback remains active until either the 16-bit deactivation code or disarm code (5-bit inband or ESF data link) is received.

Transition from Loopup to Armed State

A single inband 16-bit deactivate control code sequence is a command to all HDSL units to move from the loopup state into the armed state. All HDSL units use the same deactivation sequence. The deactivation sequence lasts a minimum of five seconds

When the units are back in the armed state, they still respond to activation sequence control codes. All HDSL units move from the loopup state into the armed state when the selected loopup time-out value is reached. The loopup time-out is programmable via the MPU.

Transition from Loopup to Disarmed State

HDSL units can be commanded to move from the loopup state into the disarmed state all at the same time by using the standard 5-bit inband disarming sequence, or by using the ESF data link sequence.

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PERFORMANCE MONITORING REPORTING LOCATIONS

Summary: Performance Monitoring (PM) information for both DS1 and HDSL is found on the MPU's main menu under Performance Monitoring. The following information is designed to show where the PM information is being reported from (that is, Near End [NEND] and Far End [FEND] PM report locations). Refer to Figure 103-1 for a drawing of the Soneplex HDSL system. Refer to Figure 103-2 for a drawing of the Soneplex T1 Repeater (RLX) system. Refer to Figure 103-3 for a drawing of the Soneplex Optical DS2 (QLX) system.

Soneplex HDSL System

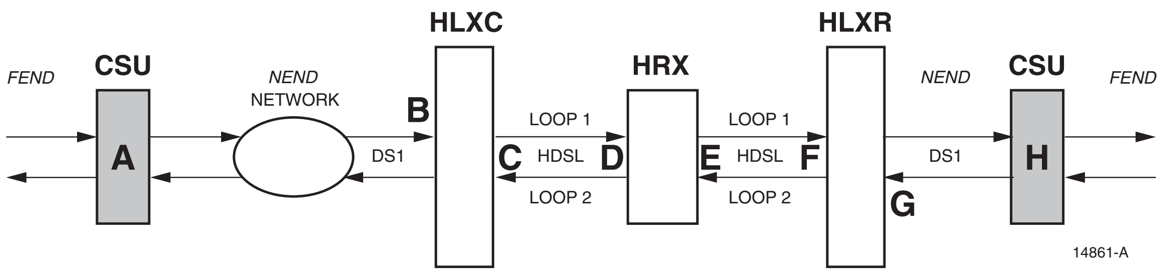

Figure 103-1. Location of Critical Alarm Points on Soneplex HDSL System

A = External CSU that will inject PRM (Performance Report Messages) back to **B** reporting all DS1 Far End Alarms. Errors or problems received at **A** are reported back to **B** via the PRM in the FDL (Facility Data Link).

B = DS1 errors at HLXC are reported as **T1-1-X-X-1** ***NEND*** PM and alarms. Report measures the actual DS1 performance as received from CSU **A**.

- OR -

DS1 errors at HLXC are reported as **T1-1-X-X-1** ***FEND*** PM and alarms from CSU **A** via the PRM in the FDL (Facility Data Link).

C = HDSL errors at HLXC are reported as **HDSL-1-X-X-1** (Loop 1) or **HDSL-1-X-X-2** (Loop 2) **NEND** PM and alarms.

D = HDSL errors at HRX are reported as **HDSL-1-X-X-1** (Loop 1) or **HDSL-1-X-X-2** (Loop 2) **REPR** PM and alarms at **HRX** on CO side.

E = HDSL errors at HRX are reported as **HDSL-1-X-X-1** (Loop 1) or **HDSL-1-X-X-2** (Loop 2) **NEND** PM and alarms at **HRX (REPC)** on CPE side.

F = HDSL errors at HLXR are reported as **HDSL-1-X-X-1** (Loop 1) or **HDSL-1-X-X-2** (Loop 2) **FEND** PM and alarms.

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G= DS1 errors at HLXR are reported as **T1-1-X-X-2** ***NEND*** PM and alarms. Report measures the actual DS1 performance as received on transmission from CSU **H**.

- OR -

DS1 errors at HLXR are reported as **T1-1-X-X-2** ***FEND*** PM and alarms from CSU **H** via the PRM in the FDL (Facility Data Link).

H= External CSU at **H** will inject PRM back to **G** reporting DS1 Far End Alarms. Errors are accumulated in the transmission of the DS1 from **A** to **H** transmit direction.

Soneplex T1 Repeater (RLX) System

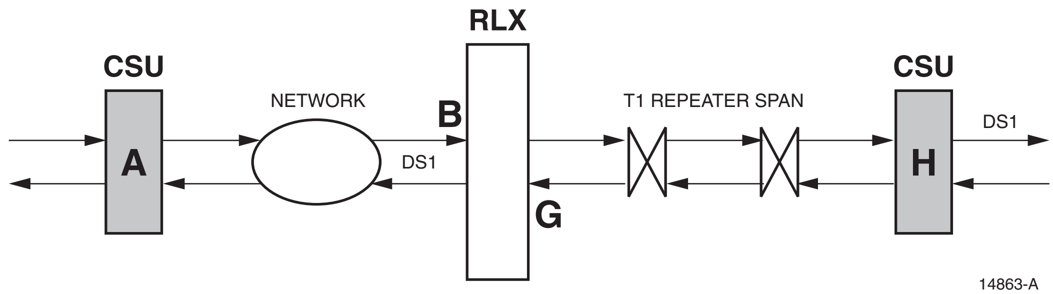

Figure 103-2. Location of Critical Alarm Points on Soneplex RLX System

A= External CSU that will inject PRM (Performance Report Messages) back to **B** reporting all DS1 Far End Alarms. This is due to corrupted data received at **A** and reported back to **B** via the PRM in the FDL (Facility Data Link).

B= RLX DS1 input monitors **T1-1-X-X-1** ***NEND*** PM and alarms. Report measures the actual DS1 performance as received on transmission from CSU **A**.

- OR -

RLX DS1 input monitors **T1-1-X-X-1** ***FEND*** PM and alarms from CSU **A** via the PRM in the FDL (Facility Data Link).

G= RLX DS1 input monitors **T1-1-X-X-2** ***NEND*** PM and alarms. This report measures the actual DS1 performance as received on transmit from CSU **H**.

- OR -

RLX DS1 input monitors **T1-1-X-X-2** ***FEND*** PM and alarms from CSU **H** via the PRM in the FDL (Facility Data Link).

H= External CSU at **H** will inject PRM back to **G** reporting DS1 Far End Alarms. This is due to corrupted data accumulated in the transmission of the DS1 from **A** to **H** transmit direction.

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Soneplex Optical DS2 (QLX) System

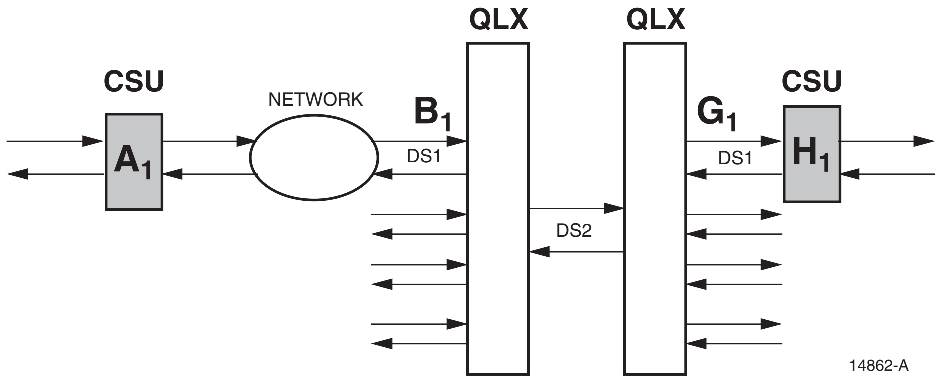

Figure 103-3. Location of Critical Alarm Points on Soneplex QLX System

A_1= External CSU that will inject PRM (Performance Report Messages) back to **B_1** reporting all DS1 Far End Alarms. This is due to corrupted data received at **A_1** and reported back to **B_1** via the PRM in the FDL (Facility Data Link).

B_1= QLX DS1 input monitors **T1-1-X-X-1 NEND** PM and alarms. Report measures the actual DS1 performance as received on transmission from CSU **A_1**.

G_1= QLX DS1 input monitors **T1-1-X-X-2 NEND** PM and alarms. This report measures the actual DS1 performance as received on transmit from CSU **H_1.**

H_1= External CSU at **H_1** will inject PRM back to **G_1** reporting DS1 Far End Alarms. This is due to corrupted data accumulated in the transmission of the DS1 from **A_1** to **H_1** transmit direction.

Note: **A_x** indicates DS1 #1 of four possible DS1s.

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TBOS INTERFACE DESCRIPTION

Summary: This section provides information for operating the Soneplex Broadband system using a Telemetry Byte Oriented Serial (TBOS) remote interface. The TBOS interface provides a reliable means of communicating transmission alarm information between an Alarm Processing telemetry Remote (APR) unit and the Soneplex Broadband system.

MPU

The MPU contains the processor, memory, and communication facilities to interface with a centralized system administration control center. The MPU monitors the alarm/status conditions of each module installed in the same chassis, as well as the alarm/status conditions of the remote modules that are connected to them. The alarm/status conditions are saved in MPU memory for transmission to the centralized administration center via TBOS protocol.

The MPU (Main Processing Unit) interfaces internally to the TBOS communications link/protocol link to report alarm/status for local and remote modules, control and report loopback configuration, and control and report protection switching status.

The MPU interfaces externally to a TBOS communications link/protocol. TBOS is the basic communications format used by the customer-provided E2A-Alarm Processing telemetry Remote (APR) equipment. The E2A-APR allows the concentration of up to 504 alarm indications onto a four-wire alarm bus. The E2A-APR operates with a centralized alarm surveillance/reporting system similar to the Bell Network Monitoring and Analysis (NMA) System and TASC (Telecommunications Alarm Surveillance and Control) or the DFMS (Digital Facility Maintenance System). AT&T Compatibility Bulletin 149 (CB-149) specifies the detailed requirements of the E2A-APR.

DS1 Signal Routing

Each DS1 signal corresponds to a specific mounting slot in the chassis. The DS1 signal and the corresponding group-slot numbers are shown in Table 104-1.

MPU TBOS Interface

The MPU TBOS interface is designed to meet AT&T CB-149, Section B2. Selection of hardware port communication parameters and TBOS display options is performed through the Craft Interface Serial Port Configuration screen.

Reference: DLP-549 Serial Port Configuration

Information is transferred between the MPU and chassis modules via a synchronous communication channel in the chassis backplane. The MPU polls each module for alarm and status data and stores it into memory until requested by TBOS. Additionally, commands issued by TBOS are passed through the MPU to the target module across this channel.

Table 104-2 (TBOS Abbreviations and Acronyms) and Table 104-3 (Expanded Scan Displays 2 Through 8 Definitions) list the definitions of the abbreviations used in the TBOS displays shown in Figure 104-1 (Expanded Scan Display 1), Figure 104-2 (Expanded Scan Displays 2 through 8), Figure 104-3 (Command Display 1), and Figure 104-4 (Command Displays 2 through 8). In Figure 104-1, scan point (bit) 5, indicates a power alarm. In Figure 104-4, when TBOS issues a command from command point 36 (D2 B8ZS), the module assigned to chassis group-slot 1-3 sets B8ZS line code on DS1 signal number two. Point 64 on the TBOS display is reserved.

Since the MPU module is used in both the Soneplex Loop Extender chassis and the Soneplex Broadband chassis, some TBOS Scan and Command points apply only to modules used only in the Soneplex Broadband chassis, such as the DS3 MUX module.

The MPU scans both the local and remote modules for presentation of alarm and status data to TBOS. On the TBOS scan displays, active scan points are identified with a “1”. Inactive points are shown by a “0”.

Commands issued from the Command Display affect any module installed in the chassis. These TBOS commands perform the same function as the corresponding commands from the MPU Craft Interface.

Scan Displays (Expanded)

The MPU provides eight Scan Displays, one for the APU and MPU modules and seven for the transmission portion of the chassis. Scan Display 1 shows conditions for the APU and MPU (see Figure 104-1). Scan displays 2 through 8 provide scan points for chassis groups 1 through 7, respectively (see Figure 104-2).

Command Displays

The MPU provides eight TBOS Command Displays for the chassis. Each command display provides command points from which the TBOS operator can remotely provision the modules. Command Display 1 shows command points for the APU and MPU (see Figure 104-3). Command displays 2 through 8 provide command points for chassis groups 1 through 7, respectively (see Figure 104-4).

Scan Displays (Compressed)

The MPU provides two Compressed Scan Displays, as shown in Figure 104-5 (Compressed Scan Display 1) and Figure 104-6 (Compressed Scan Display 2), for a total of 126 scan bits plus two reserved bits. Both displays are assigned a different display response address, in the range 0 through 7, through the MPU Craft Interface.

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Table 104-1. DS1 Signal Routing

DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER
1	1-1	8	2-4	15	4-3	22	6-2
2	1-2	9	3-1	16	4-4	23	6-3
3	1-3	10	3-2	17	5-1	24	6-4
4	1-4	11	3-3	18	5-2	25	7-1
5	2-1	12	3-4	19	5-3	26	7-2
6	2-2	13	4-1	20	5-4	27	7-3
7	2-3	14	4-2	21	6-1	28	7-4

Table 104-2. TBOS Abbreviations and Acronyms

ABBREVIATION/ ACRONYM	DESCRIPTION	ABBREVIATION/ ACRONYM	DESCRIPTION
ACO	Alarm Cut Off	LPBK	Loopback
ALM	Alarm	L/R	Local/Remote
APS	Automatic Protection Switching	LSP	Low Speed Protect Module
CL	Clear	LSW	Low Speed Working Module
CUS	Customer	MPU	Main Processing Unit
D	DS1 Signal	MX	DS3 MUX or DS3MAP Module Pair
DIS	Disable	MXP	DS3 MUX or DS3MAP Protect Module
ENAB	Enable	MXW	DS3 MUX or DS3MAP Working Module
EQ	Equipped	NET	Network
EQPT	Equipment	OOS	Out-of-Service
FAC	Facility	P, PROT	Protect
HS	High Speed	REM, RMT	Remote
HSKP	Housekeeping	REQ	Request
HSP	High Speed Protect Module	RX	Receive
HSW	High Speed Working Module	SIG	Signal
HLXC	HDSL Terminal Unit CO Side	SNR	Signal to Noise Ratio
HLXR	HDSL Terminal Unit Remote Side	SW	Switch
IS	In-Service	TX	Transmit
L	Low Speed Slot	UNEQ	Unequipped
LBO	Line Build Out	UNPROT	Unprotected
LCL, LOC	Local	W, WKG	Working
LOCK	Lockout		

Table 104-3. Expanded Scan Displays 2 Through 8 Definitions

DISPLAY	MODULE TYPE	DESCRIPTION
Lx[1] EQPT Fail	QLX	Module Fail, MPU COMM Fail, Laser Degrade, DS1 TX LOS or (SISTER COMM Fail and not SISTER MPU COMM Fail).
	HLXC/RLX	BOARD Fail or MPU COMM Fail
Lx[1] EQPT Fail RMT	QLX	Remote Board Fail
	HLXC/RLX	Not Applicable
Lx[1] Link ALM	QLX	DS2 OPTICAL COMM Fail, DS2 OPTICAL LOS, DS2 OPTICAL OOF, or DS2 OPTICAL BER
	HLXC	LOS, BER or SNR
	RLX	BER
Lx[1] RMT Link ALM	QLX	REMOTE OPTICAL COMM Fail, REMOTE DS2 OPTICAL LOS, REMOTE DS2 OPTICAL OOF, or REMOTE OPTICAL DS2 BER
	HLXC	REMOTE LOSW, DC Loop Continuity (if HLXR is line powered), BER, or SNR
	RLX	Not Applicable
Dx[1] SIG Fail	QLX,/HLXC	DS1 RX LOS
Dx[1] RMT SIG Fail	QLX,/HLXC	Remote DS1 RX LOS
Lx[1] RMT HSKP A/B	QLX	Remote Housekeeping Alarm A reported by QFLC. Remote Housekeeping Alarm B is not applicable.
	HLXC	Remote Housekeeping Alarm A or B reported by an HLXR.
	RLX	Not Applicable
Lx[1] APS DIS	QLX	Lx[1] APS Status or Lx[1] APS lockout status

[1] - x represents the chassis slot number.

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CRITICAL ALARM 1	MAJOR ALARM 2	MINOR ALARM 3	REMOTE ALARM 4	POWER ALARM 5	MPU FAIL 6	7	8
HSKP 1 ALARM 9	HSKP 2 ALARM 10	HSKP 3 ALARM 11	HSKP 4 ALARM 12	HSKP 5 ALARM 13	HSKP 6 ALARM 14	HSKP 7 ALARM 15	HSKP 8 ALARM 16
HSW EQPT FAIL 17	HSP EQPT FAIL 18	HSW SIG FAIL 19	HSP SIG FAIL 20	21	22	23	24
MXW EQPT FAIL 25	MXP EQPT FAIL 26	MXW SIG FAIL 27	MXP SIG FAIL 28	29	30	31	32
HS UNEQ 33	HS OSS 34	HSW TX OFFLINE 35	HSW RX OFFLINE 36	HS UNPROT 37	HS LBO OUT 38	HS APS DIS 39	HS NET LPBK 40
HS CUS LPBK 41	HS DS3A NET LPBK 42	HS DS3B NET LPBK 43	HS DS3A CUS LPBK 44	HS DS3B CUS LPBK 45	46	47	48
MX UNEQ 49	MX OSS 50	MXW OFFLINE 51	MX UNPROT 52	MX LBO OUT 53	MX APS DIS 54	MX NET LBPK 55	MX TX LPBK REQ 56
MX RX LPBK REQ 57	58	59	60	61	62	ACO 63	ATT RESERVED 64

Note: Bit definitions for High Speed (HS) or MUX (MX) modules are not significant when the MPU is installed in the Soneplex Loop Extender chassis.

Figure 104-1. Expanded Scan Display 1

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L1 EQPT FAIL 1	L2 EQPT FAIL 2	L3 EQPT FAIL 3	L4 EQPT FAIL 4	L1 EQPT FAIL RMT 5	L2 EQPT FAIL RMT 6	L3 EQPT FAIL RMT 7	L4 EQPT FAIL RMT 8
L1 LINK ALM 9	L2 LINK ALM 10	L3 LINK ALM 11	L4 LINK ALM 12	L1 RMT LINK ALM 13	L2 RMT LINK ALM 14	L3 RMT LINK ALM 15	L4 RMT LINK ALM 16
D1 SIG FAIL 17	D2 SIG FAIL 18	D3 SIG FAIL 19	D4 SIG FAIL 20	D1 RMT SIG FAIL 21	D2 RMT SIG FAIL 22	D3 RMT SIG FAIL 23	D4 RMT SIG FAIL 24
L1 RMT HSKP A 25	L1 RMT HSKP B 26	L2 RMT HSKP A 27	L2 RMT HSKP B 28	L3 RMT HSKP A 29	L3 RMT HSKP B 30	L4 RMT HSKP A 31	L4 RMT HSKP B 32
L1 UNEQ 33	L2 UNEQ 34	L3 UNEQ 35	L4 UNEQ 36	D1 OOS 37	D2 OOS 38	D3 OOS 39	D4 OOS 40
D1 WKG LOC LPBK 41	D2 WKG LOC LPBK 42	D3 WKG LOC LPBK 43	D4 WKG LOC LPBK 44	D1 WKG REM LPBK 45	D2 WKG REM LPBK 46	D3 WKG REM LPBK 47	D4 WKG REM LPBK 48
D1 PROT LOC LPBK 49	D2 PROT LOC LPBK 50	D3 PROT LOC LPBK 51	D4 PROT LOC LPBK 52	D1 PROT REM LPBK 53	D2 PROT REM LPBK 54	D3 PROT REM LPBK 55	D4 PROT REM LPBK 56
D1 AMI 57	D2 AMI 58	D3 AMI 59	D4 AMI 60	L1 OFFLINE 61	L1 UNPROT 62	L1 APS DIS 63	ATT RESERVED 64

Note: Bit definitions for High Speed (HS) or MUX (MX) modules are not significant when the MPU is installed in the Soneplex Loop Extender chassis.

Note: Scan Displays 3, 4, 5, 6, 7, and 8 are the same as display 2 except for the DS1 signal numbers and mounting slot numbers. One group of four mounting slots is displayed on each scan display.

Figure 104-2. Expanded Scan Displays 2 through 8

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HS EQ 1	HS UNEQ 2	HS IS 3	HS OSS 4	HS PROT 5	HS UNPROT 6	HSW RESET 7	HSP RESET 8
SW TO HSW 9	SW TO HSP 10	HS NET LPBK ON 11	HS NET LPBK OFF 12	HS A NET LPBK ON 13	HS A NET LPBK OFF 14	HS B NET LPBK ON 15	HS B NET LPBK OFF 16
HS APS ENAB 17	HS APS DIS 18	HS CL APS LOCK 19	20	21	22	23	24
HS CUS LPBK ON 25	HS CUS LPBK OFF 26	HS A CUS LPBK ON 27	HS A CUS LPBK OFF 28	HS B CUS LPBK ON 29	HS B CUS LPBK OFF 30	31	32
MX EQ 33	MX UNEQ 34	MX IS 35	MX OSS 36	MX TX LBO IN 37	MX TX LBO OUT 38	MX PROT 39	MX UNPROT 40
SW TO MXW 41	SW TO MXP 42	MX NET LPBK ON 43	MX NET LPBK OFF 44	MX CUS LPBK ON 45	MX CUS LPBK OFF 46	MXW RESET 47	MXP RESET 48
MX APS ENAB 49	MX APS DIS 50	MX CL APS LOCK 51	52	53	54	55	56
ACO 57	MPU RESET 58	59	60	61	62	63	ATT RESERVED 64

Note: Bit definitions for High Speed (HS) or MUX (MX) modules are not significant when the MPU is installed in the Soneplex Loop Extender chassis.

Figure 104-3. Command Display 1

L1 EQ ON 1	L1 EQ OFF 2	L2 EQ ON 3	L2 EQ OFF 4	L3 EQ ON 5	L3 EQ OFF 6	L4 EQ ON 7	L4 EQ OFF 8
D1 IS 9	D1 OOS 10	D2 IS 11	D2 OOS 12	D3 IS 13	D3 OOS 14	D4 IS 15	D4 OOS 16
D1 LCL LPBK ON 17	D1 LCL LPBK OFF 18	D2 LCL LPBK ON 19	D2 LCL LPBK OFF 20	D3 LCL LPBK ON 21	D3 CLC LPBK OFF 22	D4 LCL LPBK ON 23	D4 LCL LPBK OFF 24
D1 RMT LPBK ON 25	D1 RMT LPBK OFF 26	D2 RMT LPBK ON 27	D2 RMT LPBK OFF 28	D3 RMT LPBK ON 29	D3 RMT LPBK OFF 30	D4 RMT LPBK ON 31	D4 RMT LPBK OFF 32
D1 AMI 33	D1 B8ZS 34	D2 AMI 35	D2 B8ZS 36	D3 AMI 37	D3 B8ZS 38	D4 AMI 39	D4 B8ZS 40
L1 RESET 41	L2 RESET 42	L3 RESET 43	L4 RESET 44	SW TI LSW 45	SW TO LSP 46	L1 PROT 47	L1 UNPROT 48
L1 APS ENAB 49	L1 APS DIS 50	L1 CL APS LOCK 51	52	53	54	55	56
57	58	59	60	61	62	63	ATT RESERVED 64

Note: Bit definitions for High Speed (HS) or MUX (MX) modules are not significant when the MPU is installed in the Soneplex Loop Extender chassis.

Note: Command Displays 3, 4, 5, 6, 7, and 8 are the same as display 2 except for the DS1 signal numbers and chassis slot numbers. One group of four mounting slots is displayed on each command display.

Figure 104-4. Command Displays 2 through 8

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Table 104-4. Compressed TBOS Scan Display Definitions

DISPLAY	UNIT TYPE	DESCRIPTION
Critical Alarm	Shelf	Critical Alarm shelf summary
Major Alarm	Shelf	Major Alarm shelf summary
Minor Alarm	Shelf	Minor Alarm shelf summary
Remote Alarm	Shelf	Remote Alarm shelf summary
Power Alarm	Shelf	Shelf Power A or B input failure (but not both)
HSW Eqpt Alm	N/A	Not Applicable for this release
HSP Eqpt Alm	N/A	N/A for this release
HWS Fac Alm	N/A	N/A for this release
HSP Fac Alm	N/A	N/A for this release
MXW Eqpt Alm MXP Eqpt Alm	DS3 MUX	Unit Fail, MPU COMM Fail, DS3 TX LOS, or (SISTER COMM Fail and not SISTER MPU COMM Fail)
MXW Fac Alm MXP Fac Alm	DS3 MUX	DS3 RX LOS, DS3 RX OOF, DS3 Loopback
Dx[a] L/R Alarm	ODS2 & QLX	DS2 Optical COMM Fail, DS2 Optical LOS, DS2 Optical OOF, DS2 Optical BER, DS1 RX LOS, DS1 Loopback
Dx L/R Alarm	HLX	DS1 RX LOS, HDSL LOSW, HDSL BER, HDSL SNR, DC Loop Continuity (if HLXR is line powered), DS1 Loopback
Dx L/R Alarm	RLX	DS1 RX LOS, DS1 RX LOF, DS1 Loopback
Dx L/R Alarm	DLX	DS1 RX LOS, DS1 BER, DS1 Loopback
HSKPx Rmt Alm	ODS2 & QLX	Slot number is x-1: HSKP1 alarm reporting by QFLC or QLX working.
		Slot number is x-2: HSKP2 alarm reporting by QLX working only.
		Slot number is x-3: HSKP3 alarm reporting by QFLC or QLX working.
		Slot number is x-4: HSKP4 alarm reporting by QLX working only.
HSKPx Rmt Alm	HLX	Remote Housekeeping Alarm A or B reported by an HLXR
HSKPx Rmt Alm	RLX	N/A
HSKPx Rmt Alm	DLX	N/A
Lx Lcl Alarm	ODS2 & QLX	Unit Fail, MPU COMM Fail, Laser Degrade, DS1 TX LOS, or (SISTER COMM Fail and not SISTER MPU COMM Fail)
Lx Lcl Alarm	HLX	Unit Fail, MPU COMM Fail
Lx Lcl Alarm	RLX	Unit Fail, MPU COMM Fail
Lx Lcl Alarm	DLX	MPU COMM Fail
Lx Rmt Alarm	ODS2 & QLX	Remote Unit Fail
Lx Rmt Alarm	HLX	N/A
Lx Rmt Alarm	RLX	N/A
Lx Rmt Alarm	DLX	N/A

[a] "x" represents the Soneplex chassis (shelf) slot number

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CRITICAL ALARM 1	MAJOR ALARM 2	MINOR ALARM 3	REMOTE FAILURE 4	POWER ALARM 5	MPU ALARM 6	HSW EQPT ALM 7	HSP EQPT ALM 8
HSW FAC ALM 9	HSP FAC ALM 10	MXW EQPT ALM 11	MXP EQPT ALM 12	MXW FAC ALM 13	MXP FAC ALM 14	D1-1 L/R ALARM 15	D1-2 L/R ALARM 16
D1-3 L/R ALARM 17	D1-4 L/R ALARM 18	D2-1 L/R ALARM 19	D2-2 L/R ALARM 20	D2-3 L/R ALARM 21	D2-4 L/R ALARM 22	D3-1 L/R ALARM 23	D3-2 L/R ALARM 24
D3-3 L/R ALARM 25	D3-4 L/R ALARM 26	D4-1 L/R ALARM 27	D4-2 L/R ALARM 28	D4-3 L/R ALARM 29	D4-4 L/R ALARM 30	D5-1 L/R ALARM 31	D5-2 L/R ALARM 32
D5-3 L/R ALARM 33	D5-4 L/R ALARM 34	D6-1 L/R ALARM 35	D6-2 L/R ALARM 36	D6-3 L/R ALARM 37	D6-4 L/R ALARM 38	D7-1 L/R ALARM 39	D7-2 L/R ALARM 40
D7-3 L/R ALARM 41	D7-4 L/R ALARM 42	HSKP 1-1 RMT ALM 43	HSKP 1-2 RMT ALM 44	HSKP 1-3 RMT ALM 45	HSKP 1-4 RMT ALM 46	HSKP 2-1 RMT ALM 47	HSKP 2-2 RMT ALM 48
HSKP 2-3 RMT ALM 49	HSKP 2-4 RMT ALM 50	HSKP 3-1 RMT ALM 51	HSKP 3-2 RMT ALM 52	HSKP 3-3 RMT ALM 53	HSKP 3-4 RMT ALM 54	HSKP 4-1 RMT ALM 55	HSKP 4-2 RMT ALM 56
HSKP 4-3 RMT ALM 57	HSKP 4-4 RMT ALM 58	HSKP 5-1 RMT ALM 59	HSKP 5-2 RMT ALM 60	HSKP 5-3 RMT ALM 61	HSKP 5-4 RMT ALM 62	HSKP 6-1 RMT ALM 63	ATT RESERVED 64

Figure 104-5. Compressed Scan Display 1

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HSKP 6-2 RMT ALM 1	HSKP 6-3 RMT ALM 2	HSKP 6-4 RMT ALM 3	HSKP 7-1 RMT ALM 4	HSKP 7-2 RMT ALM 5	HSKP 7-3 RMT ALM 6	HSKP 7-4 RMT ALM 7	L1-1 LCL ALARM 8
L1-2 LCL ALARM 9	L1-3 LCL ALARM 10	L1-4 LCL ALARM 11	L2-1 LCL ALARM 12	L2-2 LCL ALARM 13	L2-3 LCL ALARM 14	L2-4 LCL ALARM 15	L3-1 LCL ALARM 16
L3-2 LCL ALARM 17	L3-3 LCL ALARM 18	L3-4 LCL ALARM 19	L4-1 LCL ALARM 20	L4-2 LCL ALARM 21	L4-3 LCL ALARM 22	L4-4 LCL ALARM 23	L5-1 LCL ALARM 24
L5-2 LCL ALARM 25	L5-3 LCL ALARM 26	L5-4 LCL ALARM 27	L6-1 LCL ALARM 28	L6-2 LCL ALARM 29	L6-3 LCL ALARM 30	L6-4 LCL ALARM 31	L6-1 LCL ALARM 32
L7-2 LCL ALARM 33	L7-3 LCL ALARM 34	L7-4 LCL ALARM 35	L1-1 RMT ALARM 36	L1-2 RMT ALARM 37	L1-3 RMT ALARM 38	L1-4 RMT ALARM 39	L2-1 RMT ALARM 40
L2-2 RMT ALARM 41	L2-3 RMT ALARM 42	L2-4 RMT ALARM 43	L3-1 RMT ALARM 44	L3-2 RMT ALARM 45	L3-3 RMT ALARM 46	L3-4 RMT ALARM 47	L4-1 RMT ALARM 48
L4-2 RMT ALARM 49	L4-3 RMT ALARM 50	L4-4 RMT ALARM 51	L5-1 RMT ALARM 52	L5-2 RMT ALARM 53	L5-3 RMT ALARM 54	L5-4 RMT ALARM 55	L6-1 RMT ALARM 56
L6-2 RMT ALARM 57	L6-3 RMT ALARM 58	L6-4 RMT ALARM 59	L7-1 RMT ALARM 60	L7-2 RMT ALARM 61	L7-3 RMT ALARM 62	L7-4 RMT ALARM 63	ATT RESERVED 64

Figure 104-6. Compressed Scan Display 2

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TRANSACTION LANGUAGE 1 (TL1) INTERFACE DESCRIPTION

Summary: This TAD describes the commands used to operate the Soneplex Loop Extender through a terminal using Transaction Language 1 (TL1). All operations are performed at a local and/or remote terminal using an EIA-232 interface. For additional information on TL1 commands, refer to the Soneplex TL1 Interface Specification Manual, listed under Related Publications at the beginning of this manual, for more information.

➧ **Note:** The TL1 interface is case-insensitive. All input commands are mapped to uppercase except for TID and CTAG. Size of input commands is limited to 512 bytes.

The following notational conventions are used throughout this TAD:

- cr — Carriage return
- lf — Line feed
- ^ — Blank space
- YY-MM-DD — Year-Month-Day
- HH:MM:SS — Hour:Minute:Second
- ... — Indicates zero or more repetitions of expression contained in brackets
- [ ] — One or more parameters contained in brackets are optional
- { x }— Selection of one and only one of the listed parameters is allowed
- < > — Indicate names of parameters that will be replaced by parameter values in actual TL1 transactions

TL1 Command Syntax

Any user request is considered a command. Commands generally consist of five blocks:

<command block>:<routing block>:<access block>:<correlation block>:<data block(s)>;

The **command block** consists of commands, verbs, and modifiers separated by hyphens.

<command verb> - <modifier>[-<modifier>]

For example: The command block OPR-LPBK contains the command verb OPR (OPeRate) and the modifier LPBK (LooPBacK) to provide for the loopback function. The command block SET-ATTR-T1 contains the command verb SET, the modifier ATTR (ATTRibute), and the modifier T1 to provide the mechanism for setting attributes of a T1 circuit.

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The **routing block** contains a target identifier parameter with parameter name Target Identification (TID). The TID may be any valid simple or compound TL1 identifier or text string, and is limited to 20 ASCII characters. A valid text string or the TID is defined as letters, numbers, and hyphens within double quotes. TIDs are configurable items that can be defined using TL1 provisioning driven messages. The TID is the destination code for the command. For a Network Element (NE) to accept the command the TID must be the same as the NE's system identification, which the user sets through the SET-SID command. A null TID entry for any TL1 command defaults to the system identification.

The **access block** identifies the circuit (T1, T2, T3, or HDSL) or equipment related to the command function. For commands that relate to the system itself rather than a specific circuit or equipment, no access block entry is required or permitted. When using the command modifier ALL, the access block must be null.

For commands that relate to a specific circuit access point, an access identification (AID) is required.

Reference: TAD-106 Access Identifier

The fourth required block is called the **message correlation block** and contains one parameter to serve as a Correlation Tag (CTAG). The CTAG parameter correlates an input command with its associated output response(s). The user assigns a CTAG value and it is the responsibility of the NE to copy this value into the appropriate field of the output response(s) associated with that input command. The value of a CTAG must either be a TL1 identifier or decimal numeral, consisting of no more than six characters. An example of a valid CTAG is 123 in the following command:

```
REPT-STAT ::: 123;
```

The **data block** contains all parameters that are required by the NE to complete the command. The data block is command specific and is described in each specific command and response. Parameters are separated by commas. Parameter grouping is allowed for some parameters to provide a nonsequential series of singly defined data items. An ampersand (&) is used to separate each item. An example of parameter grouping is shown in the following command:

```
RTRV-ATTR-T1 : SONEPLEX : 1-2-3-1:123: : ,LOS & LOF;
```

All parameters are either position- or keyword-defined. **Position-defined** parameters are defined by the location or order that they are entered. White space or nothing between two commas indicates a null value selection for the parameter defined in that position. **Keyword-defined** parameters may be entered in any position in the block by entering the keyword and an equal sign followed by the value being selected. A missing keyword implies selection of a null value for that parameter (usually the default value). No extra commas may be entered to imply a null default selection and no keyword may be entered without a value being entered. All parameters are position-defined unless keyword-defined is specified in the command syntax description.

It should be noted that if no data block parameters are required for a command, the colon separating the correlation block from the data block may be omitted. Trailing commas in the data block (that is, commas used as position place holders that have no parameter values following them) may also be omitted. This action selects default values and can only be used after the last required parameter. For example:

RTRV-ATTR-TI : SONEPLEX : 1-2-3-1:123::, , , , ;

RTRV-ATTR-T1 : SONEPLEX : 1-2-3-1:123;

Because of the trailing commas rule, the expression : [a] , [b] , [c] , [d] ; implies [: [[a] [, [b] [, [c] [, [d]]]]]] ;.

TL1 Response Syntax

TL1 output has three distinct types of messages:

1. Full response messages sent to indicate completion or denial of a request.
2. Acknowledgment output sent when a full response may not be sent within 2 seconds.
3. Autonomous messages that are sent without an associated command request.

Full Response Syntax

TL1 responses consist of four components:

<header> <identification of output> <text block> <end of output>

A **header** consists of the following format:

cr lf lf
^^^<SID>^YY-MM-DD^HH:MM:SS cr lf

1. SID — Source identification of the Network Element.
2. YY-MM-DD — Year - Month - Day.
3. HH:MM:SS — Hour : Minute : Second.

The **identification of output** consists of the following format:

M^^<CTAG>^<completion code> cr lf

1. M — Priority to indicate that the output is a response to an input message.
2. CTAG — Correlation code.
3. Completion code — Will contain COMPLD to acknowledge the completion of the input command or DENY to indicate that the input command was not executed. A Deny response will always include information such as an error code and comments to indicate why the command was not executed.

The **text block** contains additional information that is specific to the input command. No parameter grouping is allowed in output. No null defaults unless specified in response syntax description.

The **end of output** is a single character. A semicolon (;) is used for normal end of output. The continuation symbol, a "greater-than" sign (>), is used on a message to indicate that another associated output message follows. When the continuation symbol is used, the associated output messages must have the same CTAG and the last associated message must have a semicolon.

Example: Standard Error Response Format

The following error message format will be used whenever the NE is unable to execute a TL1 command.

```
cr lf lf
^^^<SID>^YY-MM-DD^HH:MM:SS cr lf
M^^<CTAG>^DENY cr lf
^^^<ERRCDE> cr lf
[^^^/* <comment> */cr lf]•••
;
```

1. ERRCDE — Error code.
2. Comment — Optional free form text that provides more information about the error.

Acknowledgment Output Syntax

When there is a delay of more than two seconds before a response can be sent, a brief output message is sent to acknowledge the receipt of the command. This response has three components:

```
<acknowledgment code>^[<CTAG>]cr lf
<
```

1. Acknowledgment code values:
   - IP — In progress
   - PF — Printout follows
   - OK — Okay
   - RL — Repeat later
2. CTAG — Correlation code.
3. < — Indicates end of acknowledgment output.

Autonomous Message Syntax

Autonomous messages are used to report alarms, events, and reports. The format is the same as the full response except the identification of output is replaced by:

<ALMCDE>^<ATAG>^<output code> cr lf

1. Alarm Codes (ALMCDE):
   - *C — Critical alarm
   - ** — Major alarm
   - *^ — Minor alarm
   - AA — Automatic message
2. ATAG is the autonomously generated correlation tag that the user can use to see if any spontaneous outputs have been missed by checking for omissions in the sequence of messages received. It starts with a value of one (l) and increments until the system is initialized again. Range is from 1 to 65535. When 65535 is reached, the value returns to l.
3. The output code identifies the nature of the output message. Values for the output code are: {REPT ALM | REPT EVT | REPT INITZN | REPT STAT }. The output code may have a modifier [{ T1 | EQPT }]. Refer to individual message syntax descriptions.
   - REPT ALM — Report alarm
   - REPT EVT — Report event
   - REPT INITZN — Report initialization of NE
   - REPT STAT — Report status

Autonomous Messages

Autonomous messages are used to report information that is not a direct response to a specific command. Autonomous messages are:

- REPT ALM — Report alarm
- REPT EVT — Report event
- REPT INITZN — Report initialization
- REPT STAT — Report status

TL1 Commands

The TL1 commands supported by Version 5 MPU software are listed in Table 105-1.

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Table 105-1. TL1 Commands

COMMAND	DESCRIPTION
General System Commands	
REPT-INITZN	Report Initialization
REPT-STAT	Report Status
RTRV-HDR	Retrieve header
SET-DAT	Set system time and date
SET-SID	Set system ID
DS1 Loopback Commands and Responses	
OPR-LPBK	Operate loopback
RLS-LPBK	Release loopback
RTRV-LPBK-T1	Retrieve loopback
SET-LPBK-T1	Set T1 loopback codes
Performance Monitoring Commands and Responses	
ALW-MSG	Allow automatic messages
ALW-PMREPT	Allow PM reporting on line(s) that have been inhibited
INH-MSG	Inhibit automatic messages
INH-PMREPT	Inhibit PM reporting
INIT-REG	Initialize register
OPR-ACO	Operate alarm cutoff
RTRV-ALM	Retrieve active alarms
RTRV-ATTR	Retrieve alarm attributes
RTRV-COND	Report conditions (events, etc.)
RTRV-ITH	Report internal threshold
RTRV-PM	Retrieve PM history on a line or lines
RTRV-PMSCHED	Retrieve PM schedule
RTRV-TH	Retrieve threshold
SCHED-PMREPT	Schedule PM, select parameters to measure
SET-ATTR	Set severity and activation of alarm and event reporting
SET-ITH	Set internal threshold
SET-TH	Set threshold for reporting events
SW-TOPROTN	Switch to protection
SW-TOWKG	Switch to working

(continued)

Table 105-1. TL1 Commands, continued

COMMAND	DESCRIPTION
TL1 Security Commands	
ACT-USER	Logon a user to port
CANC-USER	Logoff a user from port
DLT-SECU-USER	Remove user ID from system
ED-SECU-CMD	Change the security level required to execute command
ED-SECU-PID	Changes the PID of the current user
ED-SECU-USER	Changes the security level or password of a user
ENT-SECU-CMD	Change the security level required to execute a TL1 command
ENT-SECU-USER	Add a user to database
RTRV-SECU-CMD	Retrieves the security level required by a user
RTRV-SECU-USER	Retrieves the security level or password of a user
Administration Commands	
DLT-EQPT	Delete equipment
DLT-T1	Delete T1 configuration
ED-HDSL	Change configuration HDSL
ED-SER	Change the configuration of a serial port
ED-T1	Change configuration T1
ED-T2	Change configuration T2
ED-T3	Change configuration T3
ED-EQPT	Change equipment
ENT-EQPT	Provision equipment
ENT-T1	Provision T1
RTRV-EQPT	Retrieve equipment configuration data
RTRV-HDSL	Retrieve HDSL configuration data
RTRV-SER	Retrieve the configuration of a serial port
RTRV-T1	Retrieve T1 configuration data
RTRV-T2	Retrieve ODS2/QFLC configuration data
RTRV-T3	Retrieve T3 configuration data

(continued)

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Table 105-1. TL1 Commands, continued

COMMAND	DESCRIPTION
TEST ACCESS COMMANDS	
CONN-TACC-T1	Connect Test Access T1
DISC-TACC	Disconnect Test Access
CHG-ACCMD-T1	Change Access Mode T1
CHG-TSTSIG-T1	Change Test Signal
DISC-TSTSIG	Disconnect Test Signal
CHG-LPBK-T1	Change Loopback Signal
MEAS-SIG-T1	Measure Incoming DS1 Signal
DISC-MEAS	Terminate a Measurement
REPT-RSLT	Report Intermediate Measurement Results
TST-INSERRBITS	Insert Data or Frame Bit Errors in Test Signal

ACCESS IDENTIFIER

Summary: Circuits displayed in the Craft Interface are identified by the Access Identifier (AID). Figure 106-1 shows an example of a circuit with descriptions of each part of the AID. The DS3 signal is demultiplexed by the DS3 MUX into 28 DS1 signals and seven DS2 signals. See Table 106-1 for DS1 signal routing details. See Table 106-2 for DS2 signal routing details. See Figure 106-2 for chassis slot numbering.

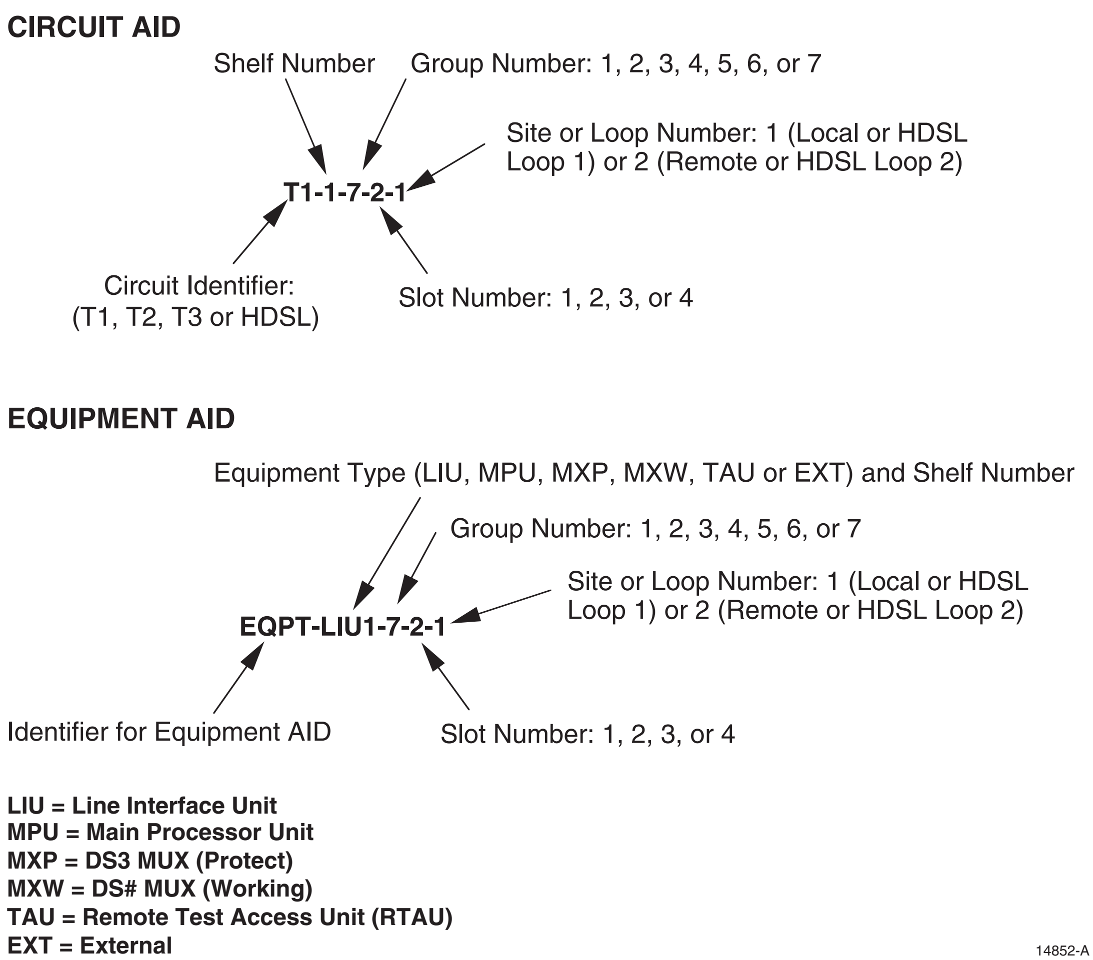

Figure 106-1. Access Identifier Display

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Table 106-1. DS1 Signal Routing

DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER	DS1 SIGNAL	GROUP-SLOT NUMBER
1	1-1	8	2-4	15	4-3	22	6-2
2	1-2	9	3-1	16	4-4	23	6-3
3	1-3	10	3-2	17	5-1	24	6-4
4	1-4	11	3-3	18	5-2	25	7-1
5	2-1	12	3-4	19	5-3	26	7-2
6	2-2	13	4-1	20	5-4	27	7-3
7	2-3	14	4-2	21	6-1	28	7-4

Table 106-2. DS2 Signal Routing

DS2 SIGNAL	GROUP-SLOT NUMBER (WORKING)	GROUP-SLOT NUMBER (PROTECT)
1	1-1	1-3
2	2-1	2-3
3	3-1	3-3
4	4-1	4-3
5	5-1	5-3
6	6-1	6-3
7	7-1	7-3

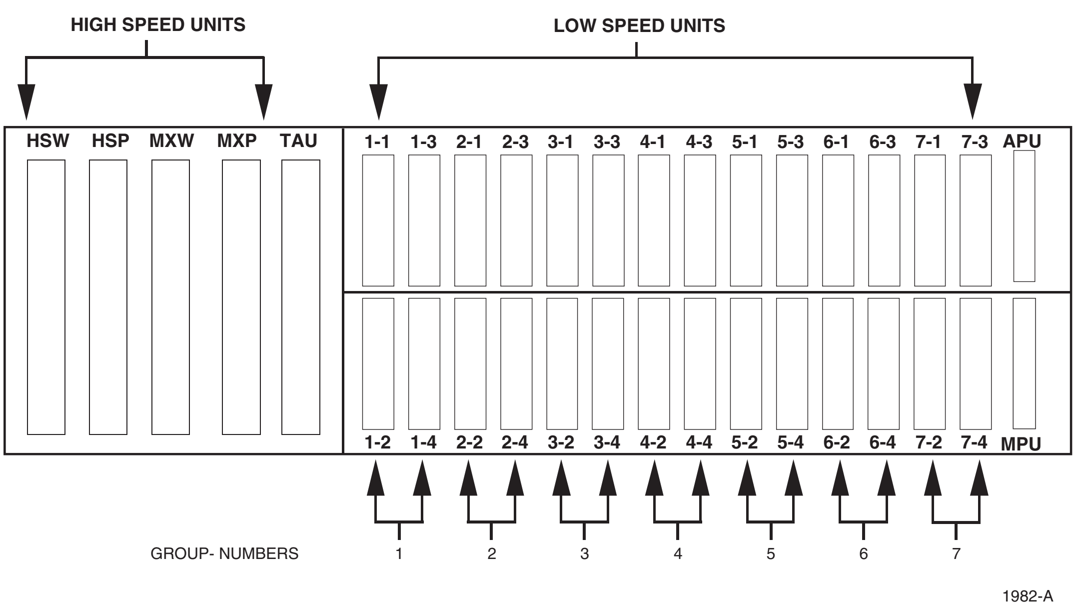

Figure 106-2. Slot Locations

ALARM TROUBLESHOOTING

Summary: This TAP describes the various alarm screens in the Craft Interface. An accurate diagnosis of the Active Alarms or Alarm History screens allows you to determine where the trouble is and dispatch the appropriate technician to isolate and repair the problem.

1. Log on to the Craft Interface. The Main Menu will then be displayed on your screen.

   Reference: DLP-526 Craft Interface System Logon

2. To silence any audible alarms, use the arrow or number keys to select System Maintenance from the Main Menu and execute an Alarm Cut-Off (ACO).

   Reference: DLP-539 ACO (Alarm Cut-Off) Command

3. Use the arrow or number keys to select Alarms from the Main Menu. Press Enter or Return. The Alarms menu will be displayed on your screen.

4. Use the arrow or number keys to select Display Active Alarms or Display Alarm History from the Alarms menu. Press Enter or Return. The screen you selected will appear. Active Alarms screens are shown in Figure 101-1 (MPU Software Version 5.1), and Figure 101-2 (V5.2). Alarm History screens are shown in Figure 101-3 (V5.1), and Figure 101-4 (V5.2).

   Note: If the date and time of the alarm are important to your diagnosis, select the Alarm History screen. The Alarm History screen displays the date and time of the alarms stored in the history file.

5. **Screen Navigation:** A maximum of 112 entries is displayed on the screen. Use the following for description of keys that can be used to navigate the screen:

KEY	ACTION
Up Arrow	Scrolls display up 1 line
Down Arrow	Scrolls display down one line
Left Arrow	Scrolls display up 1 page
Right Arrow	Scrolls display down one page
Control-R	Queries the database and refreshes the screen

6. **Column Descriptions:** There are six columns that appear on the Active Alarms screen: Access Identifier, Locn (Location), Circuit Identifier, Condition, St (Status), and ACO. There are seven columns that appear on the Alarm History screen: Date, Time, Access Identifier, Locn (Location), Circuit Identifier, Condition, and St (Status).

   The **Access ID** (AID) column identifies an entity in the chassis to which the alarm condition pertains. Different alarm conditions result in different types of AIDs. The AID consists of several parts: the Identifier, the Shelf, the Group, the Slot, and the Site or Loop Number, as described below. See Figure 101-5 for a complete definition of the Access Identifier.

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Identifier

- "EQPT-XXXY" identifies modules within the chassis where XXX represents the type of module (MPU, LIU, MXW, MXP, or EXT), and "#" represents the number of the Soneplex chassis in the system (always "1").
- "HDSL" identifies trouble on the HDSL loop. A "1" in the last column of the AID indicates trouble on HDSL Loop 1. A "2" in the last column of the AID indicates trouble on HDSL Loop 2.
- "T1" identifies trouble on the DS1 either at the local or remote site.
- "T2" identifies trouble on the DS2 either at the local or remote site.
- "T3" identifies trouble on the DS3.

Shelf Number

This is the number of the Soneplex chassis in the system.

Group Number

This is the number of the group in the chassis where the module is located (1, 2, 3, 4, 5, 6, or 7). The Group number does not apply when the identifier is T3.

Slot Number

This is the number of the slot within the group where the module is located (1, 2, 3, or 4). The Slot number does not apply when the identifier is T3.

Site or Loop Number

If HDSL appears in the first column of the access identifier and a "1" appears in this location, there is a problem on HDSL Loop 1. If HDSL appears in the first column of the circuit and a "2" appears in this location, there is a problem on HDSL Loop 2.

If "T1", "T2", "T3", or "EQPT" appears in the first column of the circuit and a "1" appears in this location, there is a problem at the local site. If "T1", "T2", "T3", or "EQPT" appears in the first column of the circuit and a "2" appears in this location, there is a problem at the remote site.

The **Locn** (Location) column displays FEND, NEND, REPR, REPC, CRP, and RRP indicating the location of the alarm. Figure 101-6 (T1 system), Figure 101-7 (HDSL system with one HRX), Figure 101-8 (HDSL system with two HRXs), and Figure 101-9 (DLX), Figure 101-10 (ODS2 system), and Figure 101-11 (RLX system) show locations and descriptions of FEND, NEND, REPR, REPC, CRP, and RRP.

The **Circuit ID** column displays the circuit identifier or facility name of the circuit in trouble.

Reference: DLP-532 DLX Configuration

Reference: DLP-531 HLX Configuration

Reference: DLP-530 ODS2 Module Configuration

Reference: DLP-533 RLXIOR Configuration

Reference: DLP-534 RLX Configuration

The **Condition** column displays the alarm condition present on the circuit. See Table 101-1 for a listing of the possible alarm conditions.

The **St** (Status) column displays Critical (CR), Major (MJ), Minor (MN), or Event (EV), indicating the degree of the alarm. When an alarm clears, it is indicated on the Alarm History screen by the letters CL. Events are reported as they occur, but are not reported as cleared when they clear. Conditions configured as Not Reported are never reported at all.

The **ACO** column indicates whether the ACO is active (YES or NO) for the particular alarm. This column is found only on the Active Alarms screen.

7. Troubleshoot the problem, following local practices. Once the problem is located and corrected, the alarm is cleared and the LEDs return to their normal state.

Stop! You have completed this procedure.

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ACTIVE ALARMS

Legend:

Access ID=Identifier[-]Shelf-Grp-Slot[-Site(1=Lcl,2=Rmt) | -Loop(1=Lp 1,2=Lp 2)]

Access ID	Locn	Circuit ID	Condition	Status	ACO
T2-1-3-1	NEND		OPTICAL LOS	MJ	NO
T2-1-3-1	NEND		OPTICAL LOF	MJ	NO
T1-7-1-1	FEND		AIS	MN	NO
T1-7-1-2	FEND		LOF	MJ	NO
HDSL-1-7-1-1	NEND		T-BERP	MN	NO
HDSL-1-7-1-1	NEND		T-SNR	EV	NO
HDSL-1-7-1-1	FEND		LOF	MJ	NO
HDSL-1-7-1-1	FEND		T-BERP	MN	NO
HDSL-1-7-1-1	FEND		T-SNR	EV	NO
HDSL-1-7-1-2	NEND		RECOVERY	MN	NO
HDSL-1-7-1-2	NEND		LOF	MJ	NO
HDSL-1-7-1-2	NEND		T-BERP	MN	NO
HDSL-1-7-1-2	NEND		T-SNR	EV	NO
HDSL-1-7-1-2	FEND		LOF	MJ	NO
HDSL-1-7-1-2	FEND		T-BERP	MN	NO
HDSL-1-7-1-2	FEND		T-SNR	EV	NO

Page 1 of 1 Press CONTROL-A for assistance

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Figure 101-1. Active Alarms Screen (MPU V5.1) (Sample)

ACTIVE ALARMS

Legend:

Access ID=Identifier[-]Shelf-Grp-Slot[-Site(1=Lcl,2=Rmt) | -Loop(1=Lp 1,2=Lp 2)]

Access ID	Locn	Circuit ID	Condition	Status	ACO
EQPT-1-3-1			GRP 2 MISMATCH	MN	NO
T2-1-3-1	NEND		OPTICAL LOF	MJ	NO
T1-1-1-4-1	NEND		AIS	EV	
T1-1-1-4-2	NEND		LOS	MJ	NO
T1-1-7-1-2	CRP1		NET LOOPED BACK	EV	NO
EQPT-LIU1-2-1-2	HLXR		INCOMPATIBLE	MN	NO
HDSL-1-7-1-1	NEND		T-SNR	EV	NO
HDSL-1-7-1-1	FEND		LOF	MJ	NO
HDSL-1-7-1-1	FEND		T-BERP	MN	NO
HDSL-1-7-1-1	FEND		T-SNR	EV	NO
HDSL-1-7-1-2	NEND		RECOVERY	MN	NO
HDSL-1-7-1-2	NEND		LOF	MJ	NO
HDSL-1-7-1-2	NEND		T-BERP	MN	NO
HDSL-1-7-1-2	NEND		T-SNR	EV	NO
HDSL-1-7-1-2	FEND		LOF	MJ	NO
HDSL-1-7-1-2	FEND		T-BERP	MN	NO
HDSL-1-7-1-2	FEND		T-SNR	EV	NO

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Figure 101-2. Active Alarms Screen (MPU V5.2) (Sample)

```
                                 ALARM HISTORY
Legend:
Access ID=Identifier[-]Shelf-Grp-Slot[-Site(1=Lcl,2=Rmt) | -Loop(1=Lp 1,2=Lp 2)]

Date     Time     Access ID        Locn Circuit ID           Condition        St
-------- -------- ---------------- ---- -------------------- ---------------- --
01/03/95 22:37:00 T1-6-1-2         FEND                      LOF               CL
01/03/95 22:37:00 T1-6-1-1         FEND                      LOF               CL
01/03/95 22:36:57 HDSL-1-6-1-2     NEND                      LOF              CL
01/03/95 22:36:57 HDSL-1-6-1-1     NEND                      LOF              CL
01/03/95 22:36:52 HDSL-1-6-1-2     FEND                      LOF              MJ
01/03/95 22:36:52 HDSL-1-6-1-1     FEND                      LOF              MJ
01/03/95 22:36:48 HDSL-1-6-1-2     FEND                      LOF              CL
01/03/95 22:36:48 HDSL-1-6-1-2     NEND                      RECOVERY         CL
01/03/95 22:36:48 HDSL-1-6-1-1     FEND                      LOF              CL
01/03/95 22:36:48 HDSL-1-6-1-1     NEND                      RECOVERY         CL
01/03/95 22:36:36 HDSL-1-6-1-2     NEND                      RECOVERY         MN
01/03/95 22:36:36 HDSL-1-6-1-1     NEND                      RECOVERY         MN
01/03/95 22:36:34 HDSL-1-6-1-2     NEND                      RECOVERY         CL
01/03/95 22:36:34 HDSL-1-6-1-1     NEND                      RECOVERY         CL
01/03/95 22:36:32 HDSL-1-6-1-1     NEND                      DC CONTINUITY    CL
01/03/95 22:36:25 HDSL-1-6-1-2     NEND                      RECOVERY         MN
01/03/95 22:36:25 HDSL-1-6-1-1     NEND                      RECOVERY         MN
Page  1 of  2            Press CONTROL-A for assistance
```

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Figure 101-3. Alarm History Screen (MPU V5.1) (Sample)

```
                                 ALARM HISTORY
Legend:
Access ID=Identifier[-]Shelf-Grp-Slot[-Site(1=Lcl,2=Rmt) | -Loop(1=Lp 1,2=Lp 2)]

Date     Time     Access ID       Locn Circuit ID          Condition       St
-------- -------- --------------- ---- ------------------- --------------- --
01/03/98 22:38:57 EQPT-LIU1-1-1-2                          HLXR INCOMPATIBLE CL
01/03/98 22:38:54 EQPT-LIU1-1-1-2                          HLXR INCOMPATIBLE MN
01/03/98 22:37:00 T1-6-1-2        FEND                     LOF             CL
01/03/98 22:37:00 T1-6-1-1        FEND                     LOF             CL
01/03/98 22:36:57 HDSL-1-6-1-2    RRP1                     LOF             CL
01/03/98 22:36:57 HDSL-1-6-1-1    RRP1                     LOF             CL
01/03/98 22:36:52 HDSL-1-6-1-2    CRP1                     LOF             MJ
01/03/98 22:36:52 HDSL-1-6-1-1    CRP1                     LOF             MJ
01/03/98 22:36:48 HDSL-1-6-1-2    CRP1                     LOF             CL
01/03/98 22:36:48 HDSL-1-6-1-2    RRP1                     RECOVERY        CL
01/03/98 22:36:48 HDSL-1-6-1-1    CRP1                     LOF             CL
01/03/98 22:36:48 HDSL-1-6-1-1    RRP1                     RECOVERY        CL
01/03/98 22:36:36 HDSL-1-6-1-2    RRP1                     RECOVERY        MN
01/03/98 22:36:36 HDSL-1-6-1-1    RRP1                     RECOVERY        MN
01/03/98 22:36:34 HDSL-1-6-1-2    RRP1                     RECOVERY        CL
01/03/98 22:36:34 HDSL-1-6-1-1    RRP1                     RECOVERY        CL
01/03/98 22:36:32 HDSL-1-6-1-1    RRP1                     DC CONTINUITY   CL

Page  1 of  2            Press CONTROL-A for assistance
```

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Figure 101-4. Alarm History Screen (MPU V5.2) (Sample)

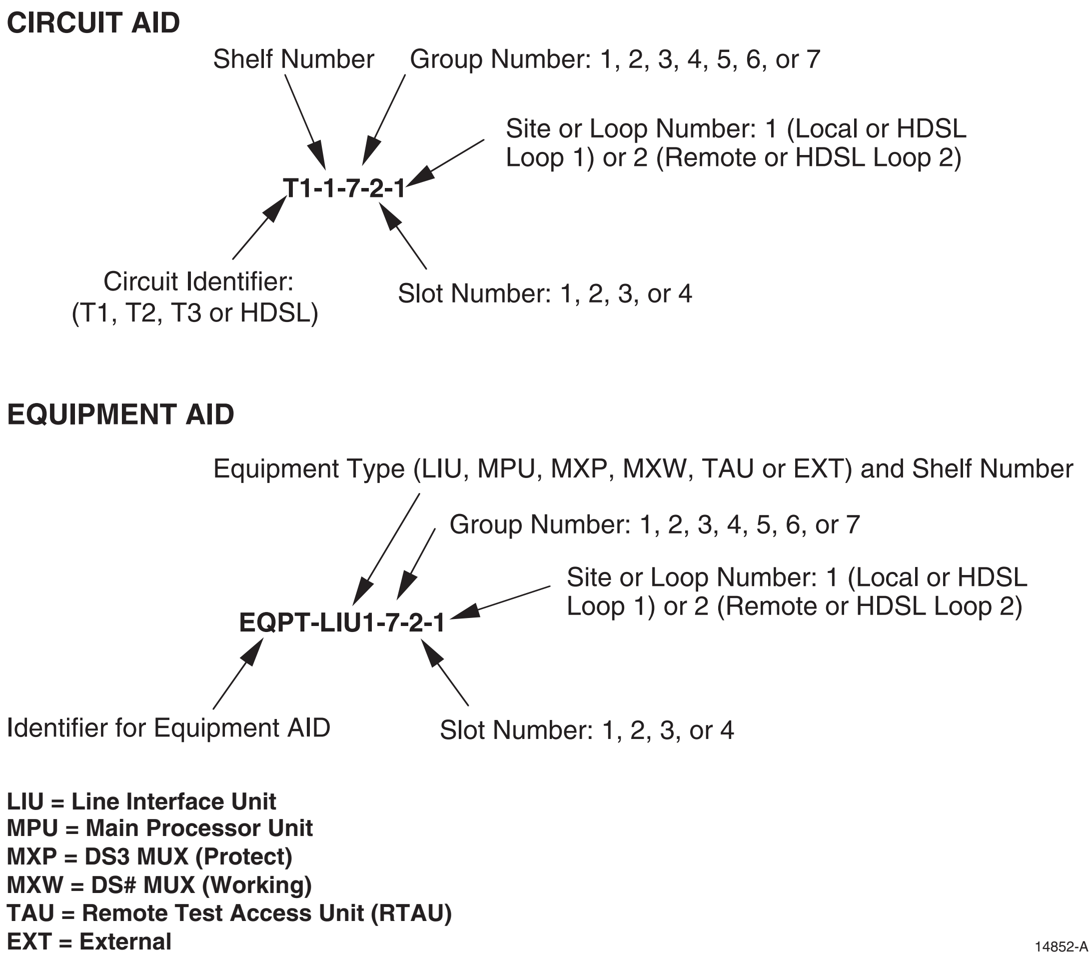

Figure 101-5. Access Identifier

Table 101-1. Alarm Descriptions/Conditions

MPU ALARMS, AID = EQPT-MPU#	
CONDITION	**DESCRIPTION**
GRP 1 MISMATCH	Invalid card type combination in group 1
GRP 2 MISMATCH	Invalid card type combination in group 2
GRP 3 MISMATCH	Invalid card type combination in group 3
GRP 4 MISMATCH	Invalid card type combination in group 4
GRP 5 MISMATCH	Invalid card type combination in group 5
GRP 6 MISMATCH	Invalid card type combination in group 6
GRP 7 MISMATCH	Invalid card type combination in group 7
POWER	Chassis power input (A or B) not connected
CGA	Carrier Group Alarm: 6 or more DS1's in MAJOR alarm
EXTERNAL ALARMS, AID = EQPT-EXT#	
CONDITION	**DESCRIPTION**
HSKP1*	Contact closure detected at HSKP IN, pair 1 on backplane
HSKP2*	Contact closure detected at HSKP IN, pair 2 on backplane
HSKP3*	Contact closure detected at HSKP IN, pair 3 on backplane
HSKP4*	Contact closure detected at HSKP IN, pair 4 on backplane
HSKP5*	Contact closure detected at HSKP IN, pair 5 on backplane
HSKP6*	Contact closure detected at HSKP IN, pair 6 on backplane
HSKP7*	Contact closure detected at HSKP IN, pair 7 on backplane
HSKP8*	Contact closure detected at HSKP IN, pair 8 on backplane
DS3 MUX ALARMS, AID = T3	
CONDITION	**DESCRIPTION**
AIS	AIS (Alarm Indication Signal) detected
APS LIMIT	APS limit of 3 switches in 24 hours has been reached, APS disabled
FORCE TO WORK	Working module forced online, APS disabled
FORCE TO PROT	Protect module forced online, APS disabled
IDLE	Idle code detected
LOF	Loss of Frame
LOOPED BACK	Signal looped back toward network
LOS	Loss of Signal
YELLOW	Yellow alarm detected

* HSKP alarm names can be configured in the Shelf Housekeeping Labels screen, described in DLP-550.

(continued)

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Table 101-1. Alarm Descriptions/Conditions, continued

DS3 MUX ALARMS, AID = EQPT-MXW#, EQPT-MXP#	
CONDITION	**DESCRIPTION**
BOARD FAIL	Fatal hardware or software error
COMM FAIL	MPU unable to communicate with DS3 MUX
CONFIG MISMATCH	Configuration mismatch with mate module
PROTECT COMM FAIL	Unable to communicate with mate module (Working-Protect)
ODS2 ALARMS, AID = EQPT-LIU#	
CONDITION	**DESCRIPTION**
BOARD FAIL	Fatal hardware or software error
COMM FAIL	MPU unable to communicate with ODS2
CONFIG MISMATCH	Configuration mismatch with mate module or remote module
RMT-HSKP1 or RMT-HSKP2	Housekeeping alarm detected at remote end (QFLC or QLX)
PROTECT COMM FAIL	Unable to communicate with mate module (Working-Protect)
OPTICAL COMM FAIL	Unable to communicate with remote module
VERSION MISMATCH	Incompatible software versions with mate module or remote module
ODS2 ALARMS, AID = T1	
CONDITION	**DESCRIPTION**
LOOPED BACK	Signal looped back at either ODS2 or remote
RECEIVE LOS	Loss Of Signal detected at remote end (QFLC or QLX)
TRANSMIT LOS	Transmit Loss of Signal detected at remote end (QFLC or QLX), hardware failure
ODS2 ALARMS, AID = T2	
CONDITION	**DESCRIPTION**
APS LIMIT REACHED	APS limit of 3 switches in 24 hours has been reached, APS disabled
FORCE TO WORK	Working module forced online, APS disabled
FORCE TO PROT	Protect module forced online, APS disabled
LASER DEGRADE	Laser driver degradation, hardware failure
OPTICAL LOF	Optical Loss of Frame
OPTICAL LOS	Optical Loss Of Signal
T-BER	Bit Error Rate exceeds user-defined threshold

(continued)

Table 101-1. Alarm Descriptions/Conditions, continued

HLXC ALARMS, AID = EQPT-LIU#	
CONDITION	**DESCRIPTION**
BOARD FAIL	Fatal hardware or software error
COMM FAIL	MPU unable to communicate with HLXC
HLXR INCOMPATIBLE	Incompatible software versions with remote module
HRX INCOMPATIBLE	Incompatible software versions with HRX
LOOP REVERSAL	Pairs crossed at HLXR
TP/RNG REVERSAL	Tip and Ring reversed (either loop)
PRIMARY POWER	Local power fail indication (1) detected at HLXR
SECONDARY POWER	Local power fail indication (2) detected at HLXR
HLXC ALARMS, AID = T1	
CONDITION	**DESCRIPTION**
AIS	AIS detected
LOOPBACK	Signal looped back toward network
LOF	DS1 Loss of Frame
LOS	DS1 Loss of Signal
T-BERL	DS1 BER threshold crossed (based on BPVs)
YEL	Yellow alarm (DS1) detected
HLXC ALARMS, AID = HDSL	
CONDITION	**DESCRIPTION**
DC CONTINUITY	Loss of loop power DC continuity detected
LOF	Loss of Frame (a.k.a. HDSL Loss of Sync Word (LOSW) Failure)
RECOVERY	HDSL loop is performing start-up process
T-BERP	HDSL loop BER threshold crossed (based on HDSL CRC)
T-PA	HDSL Pulse Attenuation threshold crossed.
T-SNR	HDSL loop SNR threshold crossed
HLXC ALARMS, AID = EQPT-EXT#	
CONDITION	**DESCRIPTION**
RMT-HSKP1	Housekeeping contact closure (1) detected at HLXR
RMT-HSKP2	Housekeeping contact closure (2) detected at HLXR

(continued)

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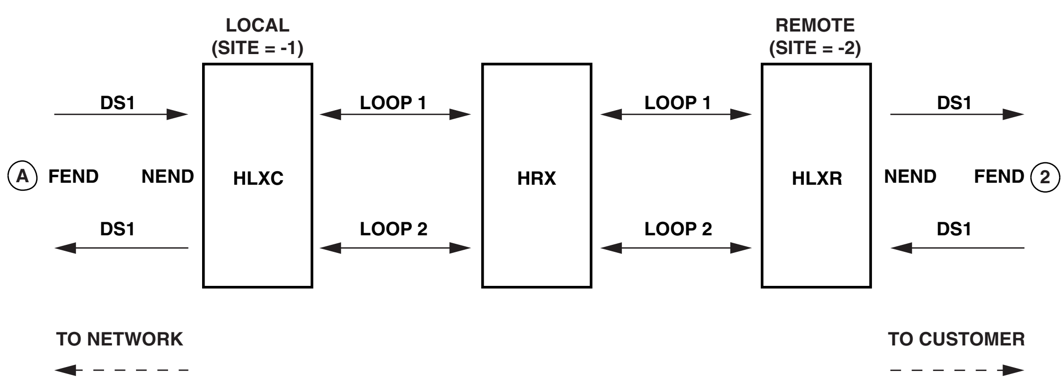
Table 101-1. Alarm Descriptions/Conditions, continued

DLX ALARMS, AID = EQPT-LIU#	
CONDITION	**DESCRIPTION**
COMM FAIL	MPU unable to communicate with DLX
DLX ALARMS, AID = T1	
CONDITION	**DESCRIPTION**
LOOPED BACK	Signal looped back toward network
LOS	DS1 Loss of Signal
T-BERL	DS1 BER threshold crossed (based on BPVs)



KEY
NEND means "PM information collected directly from incoming T1 signals, both at local and remote sites."
FEND means "ESF PRM information collected at the opposite ends of spans from the affected circuit and returned to the system via the ESF Datalink, both at local and remote sites". The framing format must be ESF in order for FEND information to be displayed.
Note: For Site 1, FEND information is at A; for Site 2, FEND information is at 2.

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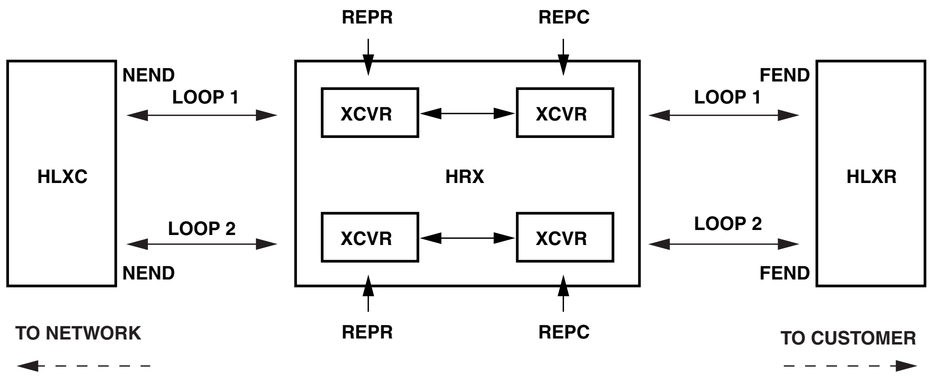
Figure 101-6. T1 HLXC/HRX/HLXR NEND and FEND Locations

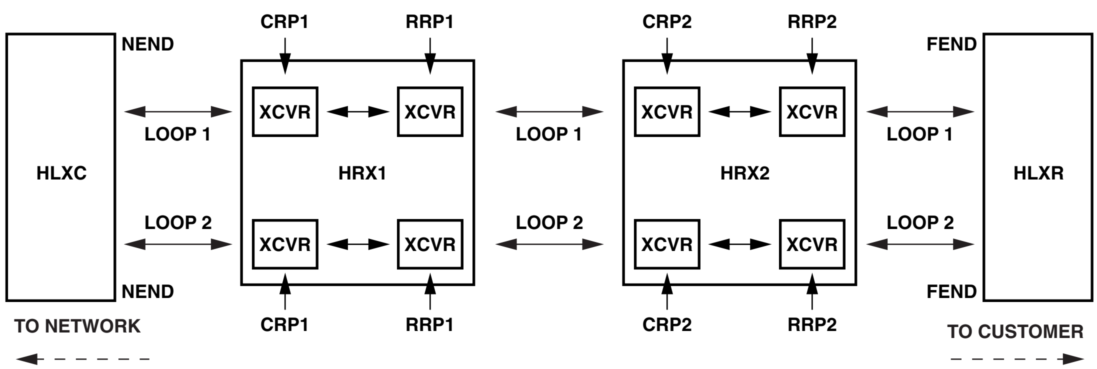


KEY
NEND means "at the HLXC, looking toward the customer (HLXR)."
FEND means "at the HLXR, looking toward the network (HLXC)."
REPC means "at the HRX, looking toward the customer (HLXR)."
REPR means "at the HRX, looking toward the network (HLXC). "

REPR (PM Reports) = C-SIDE (Display Status) = LINE 1 (TL1)
REPC (PM Reports) = R-SIDE (Display Status) = LINE 2 (TL1)

9450-B

Figure 101-7. HDSL HLXC/HRX/HLXR NEND and FEND Locations (MPU V5.1)



KEY
NEND means "at the HLXC, looking toward the customer (HLXR)."
FEND means "at the HLXR, looking toward the network (HLXC)."
CRP1 means "at the central office side of the HRX1, looking toward the network (HRX2/HLXR)."
RRP1 means "at the remote (CPE) side of the HRX1, looking toward the customer (HLXC)."
CRP2 means "at the central office side of the HRX2, looking toward the network (HLXR)."
RRP2 means "at the remote (CPE) side of the HRX2, looking toward the customer (HRX1/HLXC)."

CRP1 (Alarm History, PM Reports, and Status screens) = LINE 1 (TL1)
RRP1 (Alarm History, PM Reports, and Status screens) = LINE 2 (TL1)
CRP2 (Alarm History, PM Reports, and Status screens) = LINE 3 (TL1)
RRP2 (Alarm History, PM Reports, and Status screens) = LINE 4 (TL1)

NOTE: CRP2 and RRP2 are not present when there is no HRX2.

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Figure 101-8. HDSL HLXC/HRX/HLXR NEND and FEND Locations (MPU V5.2)

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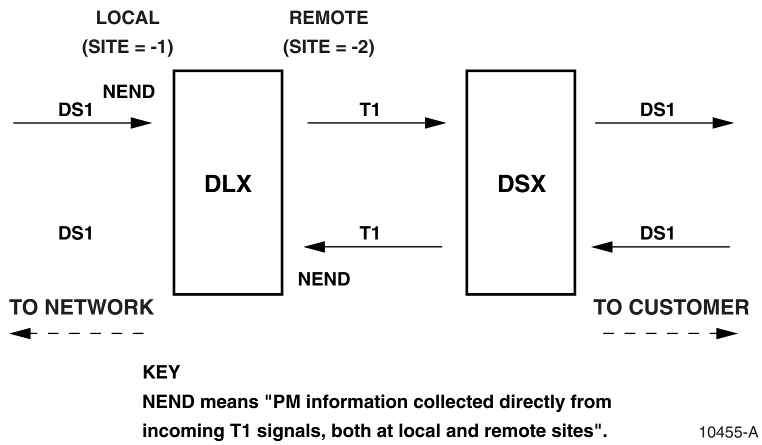

Figure 101-9. DLX NEND Locations

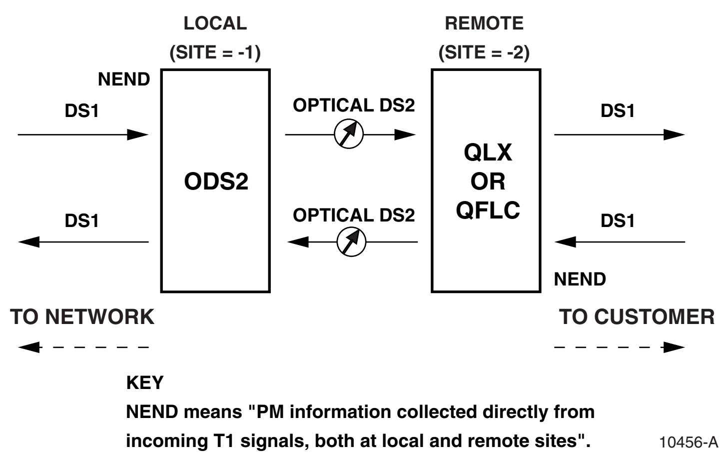

Figure 101-10. ODS2 NEND Locations

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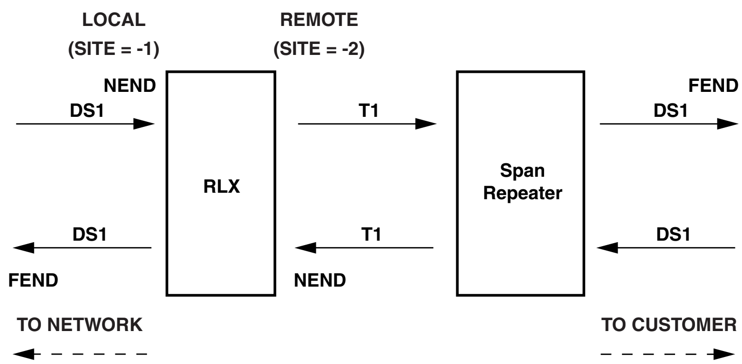

KEY
NEND means "PM information collected directly from incoming T1 signals, both at local and remote sites".
FEND means "ESF PM information collected at the opposite end of spans from the affected circuit and returned to the system via ESF datalink". The framing format must be ESF in order for FEND information to be displayed.

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Figure 101-11. RLX NEND and FEND Locations

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PERFORMANCE MONITORING REPORTS DESCRIPTION

The Craft Interface provides 15-Minute Performance Monitoring (PM), Daily PM, and Summary PM reports when you select Performance Monitoring at the Main Menu. Performance Monitoring reports are based on the data stored in the MPU memory.

➧ **Note:** Parameters that do not apply to a given module have a hyphen (-) replacing the numeric value in all PM reports.

15-Minute Performance Monitoring Report

This report displays the Mon Type PM data for the current 15-minute period and the previous thirty-two 15-minute periods.

Daily Performance Monitoring Report

This report displays the Mon Type PM data for the current day and the previous seven daily periods.

Summary Performance Monitoring Report

This report displays the Mon Type PM data for the previous 15-minute period, current 15-minute period, previous day, and current day.

Performance Monitoring Reports are shown in Figure 102-1 (DS1 15-Minute) Figure 102-2 (DS1 Daily), Figure 102-3 (DS1 Summary), Figure 102-4 (HDSL 15-Minute), Figure 102-5 (HDSL Daily), and Figure 102-6 (HDSL Summary). Retrieve the Performance Monitoring Report that you wish to view.

Reference: DLP-565 Performance Monitoring Reports Retrieval

Mon Types

The MPU evaluates the current counts and derived parameters for threshold violations once per second. There are 15-minute and daily threshold settings for all counts and derived parameters. These thresholds define the number of errors that constitute a 15-minute or daily threshold violation when exceeded. These 15-minute and daily thresholds may be set for any one or all the Mon Types. Mon Types and descriptions are given in Tables 102-1 and 102-2. For descriptions of locations where thresholds are monitored (such as FEND, NEND, REPC, REPR, CRP, and RRP), refer to Figure 102-7 (T1 system), Figure 102-8 (HDSL system), Figure 102-9 (DLX system), Figure 102-10 (ODS2 system), and Figure 102-11 (RLX system).

Note: In the DS1 Performance Reports screens, Figure 102-1 (DS1 15-Minute), Figure 102-2 (DS1 Daily), Figure 102-3 (DS1 Summary), NE (Near End) and FE (Far End) apply to the entire time period (e.g., 00:15), not just the statistics that appear on their respective lines. In addition, the headings shown over each column apply respectively to each statistic in the column. For example, in Figure 102-1, "FCP" applies to the first column, first row; "CVL" applies to the first column, second row; and "ESL" applies to the first column, third row.

Note: In Figure 102-1 (DS1 15-Minute), Figure 102-2 (DS1 Daily), Figure 102-3 (DS1 Summary), Figure 102-4 (HDSL 15-Minute), Figure 102-5 (HDSL), and Figure 102-6 (HDSL Summary), certain status abbreviations are used and are described below:

- COMPL means "Completed".
- PRTL means "Partial" when all the statistics from the time period have not yet been compiled, or when data has been lost.
- NA means "Not Applicable" when SF framing is in use.

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Table 102-1. DS1 Mon Type Descriptions

MON TYPE	MEANING	LOCATION	DESCRIPTION
CVL	Code Violation Line	NEND	Count of Bipolar Violations (BPV) and excessive zeros (EXZ) in the DS1 signal. **Note:** The maximum rate of indications across HDSL loops that the far end can report is 166.7 BPV per second (10,000 per minute).
LOSS	Loss Of Signal Second	NEND	A second in which one or more Loss Of Signal defects occurred.
ESL	Errored Second Line	NEND	A second in which there occurred one or more BPVs, one or more EXZs, or one or more LOS defects.
SESL	Severely Errored Second Line	NEND	A second in which more than some user specified value of CVLs or one or more LOS defects occurred.
FCP	Failure Count Path	NEND	A count of Loss Of Frame (LOF) or Alarm Indication Signal (AIS) failures within the interval. A failure is counted when the failure condition transitions from OFF to ON. Failure count is independent of the duration (in seconds) of the failure condition.
CVP	Code Violation Path	NEND	Count of (FE) Frame sync Errors in SF format or count of CRC errors in ESF format.
AISSP	AIS Second Path	NEND	A second containing one or more AIS defects.
SASP	SEF/AIS Second Path	NEND	A second containing one or more AISSPs or one or more SEF (Severely Errored Framing/OOF) defects.
ESP	Errored Second Path	NEND	**SF framing format:** this is a second in which there occurred one or more FE events, one or more SEF defects, or one or more AIS defects. **ESF framing format:** this is a second in which there occurred one or more CVP errors, one or more SEF defects, or one or more AIS defects.
SESP	Severely Errored Second Path	NEND	**SF framing format:** this is a second in which there occurred more than eight FE events, one or more SEF defects, or one or more AIS defects. **ESF framing format:** this is a second in which there occurred more than some user specified value of CVP errors, one or more SEF defects, or one or more AIS defects.

Note: DS1 Path Parameters are collected at the HLXC for both directions, as shown in Figure 102-7.

Note: Far-end parameters are not derived from defects detected in the incoming signal but rather from the PRM (Performance Report Messages) embedded in the incoming signal from the far end. A Remote Alarm Indication condition disallows reception of a valid PRM. The framing format must be ESF for FEND information to be transmitted and displayed.

Note: For complete information on counts, refer to ANSI T1.231.

(continued)

Table 102-1. DS1 Mon Type Descriptions, continued

MON TYPE	MEANING	LOCATION	DESCRIPTION
UASP	Unavailable Second Path	NEND	A count of second(s) in which the DS1 signal is not available. A signal becomes unavailable upon the completion of ten consecutive SESPs. A signal becomes available again at the completion of ten consecutive seconds with no SESPs. When a path is unavailable, no other PM counts are maintained.
FCP-FE	Failure Count Path	FEND	A count of Loss Of Frame (LOF) or Remote Alarm Indication (RAI) failures within the interval. This is also called a Yellow alarm. A failure is counted when the failure condition transitions from OFF to ON. Failure count is independent of the duration (in seconds) of the failure condition.
ESL-FE	Errored Second Line	FEND	A second in which there occurred one or more BPVs, one or more EXZs, or one or more LOS defects. Derived from Line Code violation indicator in the PRM.
CVP-FE	Code Violation Path	FEND	Count of CRC errors in ESF format. Derived from PRM GBIT (G1 – G6) indicators.
SEFSP-FE	Severely Errored Framing Second Path	FEND	Derived from PRM Severely Errored Framing Event (SE).
ESP-FE	Errored Second Path	FEND	This is a second in which there occurred one or more CVP errors, one or more SEF defects, or one or more AIS defects. Derived from PRM G1 - G6, SE, or Slip Event (SL) indicator, or the occurrence of an RAI failure.
SESP-FE	Severely Errored Second Path	FEND	This is a second in which there occurred more than some user-specified value of CVP errors, one or more SEF defects, or one or more AIS defects.
CSSP-FE	Controlled Slip second Path	FEND	A second in which one or more controlled frame slips occurred. Derived from PRM SL indicator.
UASP-FE	Unavailable Second Path	FEND	A count of second(s) in which the DS1 signal is not available. A signal becomes unavailable upon the completion of ten consecutive SESPs. A signal becomes available again at the completion of ten consecutive seconds with no SESPs. When a path is unavailable, no other PM counts are maintained. Derived from SESP-FEs.

Note: DS1 Path Parameters are collected at the HLXC for both directions, as shown in Figure 102-7.

Note: Far-end parameters are not derived from defects detected in the incoming signal but rather from the PRM (Performance Report Messages) embedded in the incoming signal from the far end. A Remote Alarm Indication condition disallows reception of a valid PRM. The framing format must be ESF for FEND information to be transmitted and displayed.

Note: For complete information on counts, refer to ANSI T1.231.

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Table 102-2. HDSL Mon Type Descriptions

MON TYPE	MEANING	LOCATION	DESCRIPTION
FCP	Failure Count Path	NEND, FEND, REPC, REPR, CRP, RRP*	Count of Loss Of Sync Word (LOSW) failures on the HDSL loop.
CVP	Code Violation Path	NEND, FEND, REPC, REPR, CRP, RRP	Count of CRC errors on the HDSL loop.
ESP	Errored Second Path	NEND, FEND, REPC, REPR, CRP, RRP	A second in which one or more CRC errors occurred on the HDSL loop, and no LOSW defects occurred.
SESP	Severely Errored Second Path	NEND, FEND, REPC, REPR, CRP, RRP	A second in which the number of CRC errors on the HDSL loop was greater than or equal to some user-specified value, and no LOSW defects occurred.
SEFSP	Severely Errored Framing Second Path	NEND, FEND, REPC, REPR, CRP, RRP	A second in which one or more LOSW defects occurred on the HDSL loop.
PA-H	Pulse Attenuation – High Path	NEND, FEND, REPC, REPR, CRP, RRP	Highest Pulse Attenuation value detected on the HDSL loop within the interval. This value is only updated when the HDSL loop is active. If the HDSL loop has never been activated, this value will be set to 0.
SNR-L	Signal-to-Noise Ratio – Low Path	NEND, FEND, REPC, REPR, CRP, RRP	Lowest SNR detected on the HDSL loop within the interval. This value is only updated when the HDSL loop is active. If the HDSL loop has never been activated, this value will be set to 71.

* For descriptions of locations where thresholds are monitored (such as FEND, NEND, REPC, REPR, CRP, and RRP), refer to Figure 102-7 (T1 system), Figure 102-8 (HDSL system), Figure 102-9 (DLX system), Figure 102-10 (ODS2 system), and Figure 102-11 (RLX system).

```
                     DS1 PERFORMANCE MONITORING REPORTS

    Group: 6     Circuit: 1     Site: LOCAL      Report Type: 15-MINUTE
                      Circuit ID:

                         FCP    SESL     ESP    SASP   FCP-FE  ESP-FE  CSSP-FE
                         CVL    LOSS    SESP   AISSP   ESL-FE SESP-FE SEFSP-FE
PERIOD   STATUS          ESL     CVP    UASP           CVP-FE UASP-FE
======== =========== ======= ======= ======= ======= ======== ======= ========
00:15    NE: NA            0       0       0       0        0       0        0
         FE: NA            0       0       0       0        0       0        0
                           0       0       0                0       0

00:00    NE: NA            0       0       0       0        0       0        0
         FE: NA            0       0       0       0        0       0        0
                           0       0       0                0       0






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Figure 102-1. DS1 15-Minute Performance Monitoring Report

```
                     DS1 PERFORMANCE MONITORING REPORTS

    Group: 6     Circuit: 1     Site: LOCAL      Report Type: DAILY
                      Circuit ID:

                         FCP    SESL     ESP    SASP   FCP-FE  ESP-FE  CSSP-FE
                         CVL    LOSS    SESP   AISSP   ESL-FE SESP-FE SEFSP-FE
PERIOD   STATUS          ESL     CVP    UASP           CVP-FE UASP-FE
======== =========== ======= ======= ======= ======= ======== ======= ========
01/01/93 NE: NA            0       0       0       0        0       0        0
         FE: NA            0       0       0       0        0       0        0
                           0       0       0                0       0










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Figure 102-2. DS1 Daily Performance Monitoring Report

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```
                     DS1 PERFORMANCE MONITORING REPORTS

    Group: 6     Circuit: 1     Site: LOCAL      Report Type: SUMMARY
                      Circuit ID:

                         FCP     SESL     ESP    SASP   FCP-FE  ESP-FE  CSSP-FE
                         CVL     LOSS    SESP   AISSP   ESL-FE SESP-FE SEFSP-FE
PERIOD   STATUS          ESL      CVP    UASP           CVP-FE UASP-FE
======== =========== ======= ======= ======= ======= ======== ======= ========
00:15    NE: NA            0       0       0       0        0       0        0
         FE: NA            0       0       0       0        0       0        0
                           0       0       0                0       0

00:00    NE: NA            0       0       0       0        0       0        0
         FE: NA            0       0       0       0        0       0        0
                           0       0       0                0       0

01/01/93 NE: NA            0       0       0       0        0       0        0
         FE: NA            0       0       0       0        0       0        0
                           0       0       0                0       0



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Figure 102-3. DS1 Summary Performance Monitoring Report

```
                     HDSL PERFORMANCE MONITORING REPORTS

          Group: 1     Circuit: 2     Loop: 1    Report Type: 15-MINUTE
                          Circuit ID:

PERIOD   LOCN STAT    FCP      CVP     ESP     SESP    SEFSP     PA-H    SNR-L
======== ==== ===== ======== ======= ======= ======= ======== ======= ========
00:00    NEND COMPL        0       0       0       0        0       0       17
         FEND COMPL        0       0       0       0        0       0       17
         CRP1 COMPL        0       0       0       0        0       0       17
         RRP1 COMPL        0       0       0       0        0       0       17

23:45    NEND COMPL        0       0       0       0        0       0       17
         FEND COMPL        0       0       0       0        0       0       17
         CRP2 COMPL        0       0       0       0        0       0       17
         RRP2 COMPL        0       0       0       0        0       0       17

23:30    NEND COMPL        0       0       0       0        0       0       17
         FEND COMPL        0       0       0       0        0       0       17
         CRP1 COMPL        0       0       0       0        0       0       17
         RRP1 COMPL        0       0       0       0        0       0       17

23:15    NEND COMPL        0       0       0       0        0       0       17

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Figure 102-4. HDSL 15-Minute Performance Monitoring Report

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```
                     HDSL PERFORMANCE MONITORING REPORTS

          Group: 1     Circuit: 2     Loop: 1    Report Type: DAILY
                         Circuit ID:

PERIOD   LOCN STAT   FCP     CVP     ESP     SESP    SEFSP     PA-H    SNR-L
========  ==== ===== ======== ======= ======= ======= ======== ======= ========
06/01/98  NEND COMPL       0       0       0       0        0       0       17
          FEND COMPL       0       0       0       0        0       0       17
          REPR COMPL       0       0       0       0        0       0       17
          REPC COMPL       0       0       0       0        0       0       17











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Figure 102-5. HDSL Daily Performance Monitoring Report

```
                     HDSL PERFORMANCE MONITORING REPORTS

          Group: 1     Circuit: 2     Loop: 1    Report Type: SUMMARY
                         Circuit ID:

PERIOD   LOCN STAT    FCP     CVP     ESP     SESP    SEFSP     PA-H    SNR-L
======== ==== ===== ======== ======= ======= ======= ======== ======= ========
00:00    NEND COMPL        0       0       0       0        0       0        0
         FEND COMPL        0       0       0       0        0       0        0
         REPR COMPL        0       0       0       0        0       0        0
         REPC COMPL        0       0       0       0        0       0        0

23:45    NEND COMPL        0       0       0       0        0       0        0
         FEND COMPL        0       0       0       0        0       0        0
         REPR COMPL        0       0       0       0        0       0        0
         REPC COMPL        0       0       0       0        0       0        0

06/01/95 NEND COMPL        0       0       0       0        0       0        0
         FEND COMPL        0       0       0       0        0       0        0
         REPR COMPL        0       0       0       0        0       0        0
         REPC COMPL        0       0       0       0        0       0        0

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Figure 102-6. HDSL Summary Performance Monitoring Report

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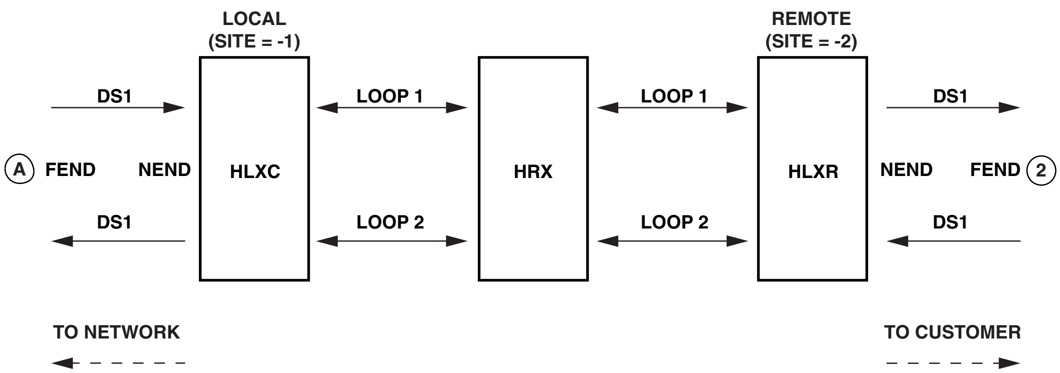

KEY
NEND means "PM information collected directly from incoming T1 signals, both at local and remote sites."
FEND means "ESF PRM information collected at the opposite ends of spans from the affected circuit and returned to the system via the ESF Datalink, both at local and remote sites". The framing format must be ESF in order for FEND information to be displayed.
Note: For Site 1, FEND information is at A; for Site 2, FEND information is at 2.

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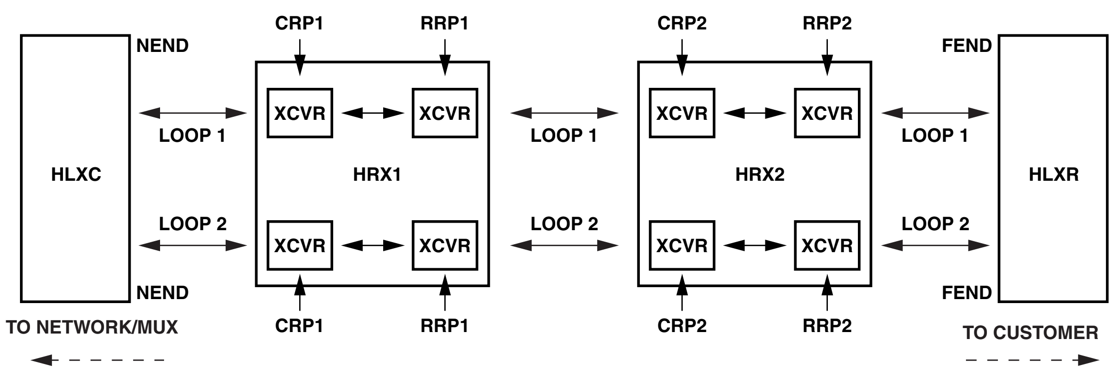
Figure 102-7. T1 HLXC/HRX/HLXR NEND and FEND Locations



KEY
NEND means "at the HLXC, looking toward the customer (HLXR)."
FEND means "at the HLXR, looking toward the network (HLXC)."
CRP1 means "at the central office side of the HRX1, looking toward the network (HLXC)."
RRP1 means "at the remote (CPE) side of the HRX1, looking toward the customer (HRX2/HLXR)."
CRP2 means "at the central office side of the HRX2, looking toward the network (HRX1/HLXC)."
RRP2 means "at the remote (CPE) side of the HRX2, looking toward the customer (HLXR)."

CRP1 (Alarm History, PM Reports, and Status screens) = LINE 1 (TL1)
RRP1 (Alarm History, PM Reports, and Status screens) = LINE 2 (TL1)
CRP2 (Alarm History, PM Reports, and Status screens) = LINE 3 (TL1)
RRP2 (Alarm History, PM Reports, and Status screens) = LINE 4 (TL1)

NOTE: CRP2 and RRP2 are not present when there is no HRX2.

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Figure 102-8. HDSL HLXC/HRX/HLXR NEND and FEND Locations

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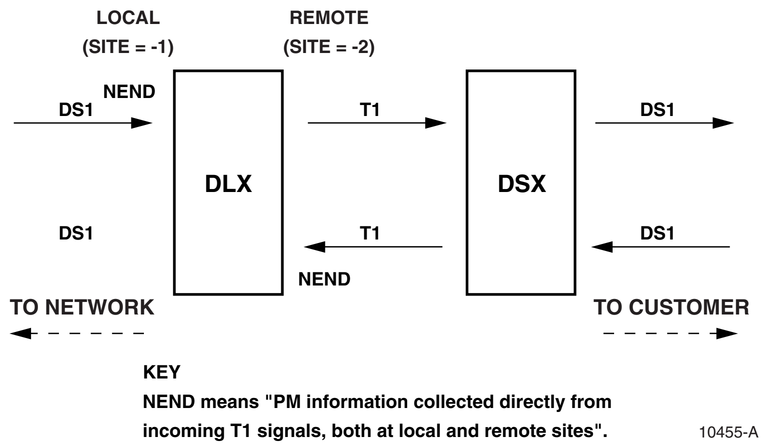

Figure 102-9. DLX NEND Locations

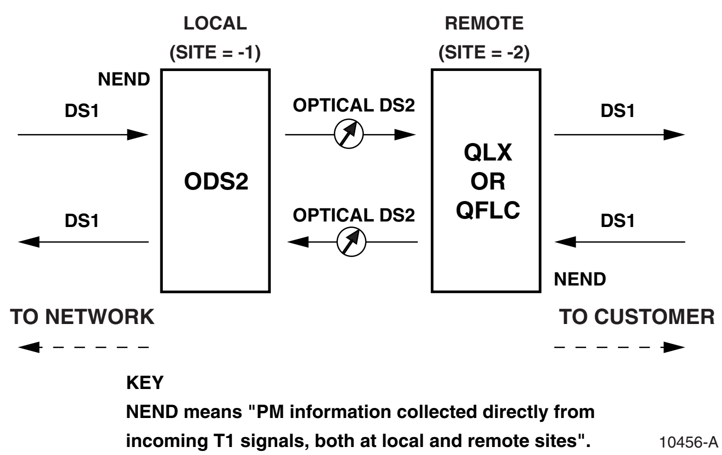

Figure 102-10. ODS2 NEND Locations

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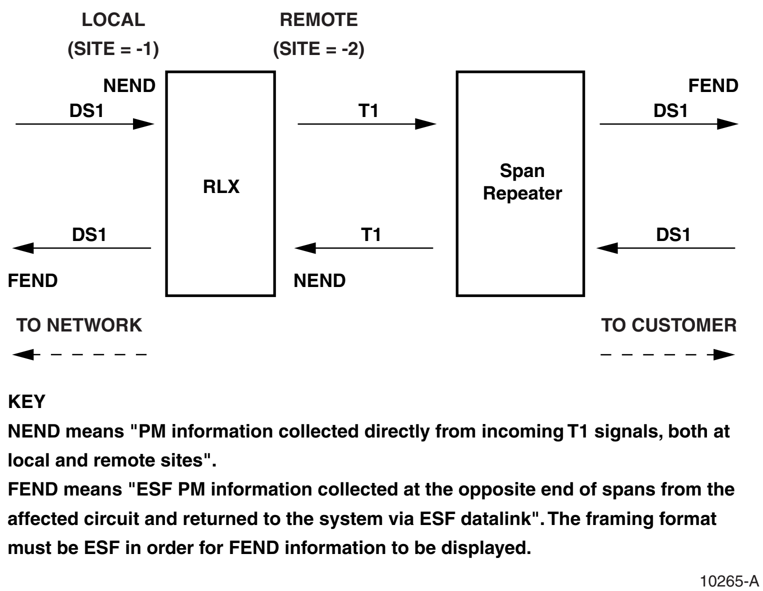

Figure 102-11. RLX NEND and FEND Locations

LOCAL CRAFT INTERFACE CONNECTION TROUBLESHOOTING

This TAP describes how to troubleshoot local Craft Interface connections.

1. Verify that you have the correct cable and connectors for the port you intend to use:
   - A straight-through RS-232 25-pin D-sub female connectorized cable is required to connect to the MPU.
   - A null-modem RS-232 25-pin D-sub female connectorized cable is required to connect to chassis Port 2 or 3.

   Reference: DLP-504 Local Craft Interface Connection

2. Verify that the cable length is correct for your application by referring to the EIA-232 protocol. The maximum length is 50 feet.

3. Verify that the cables and connectors are in good working condition.

4. Verify that you are using a control terminal (VT-100 or equivalent) or a host computer with VT-100 emulation.

5. Verify that the MPU is functioning properly by re-installing it. This procedure is non-service-affecting.

   Reference: DLP-502 MPU Installation and Testing

   Reference: DLP-519 MPU Replacement and Testing

6. If you are using chassis Port 2 or 3 and are unable to logon to the local Craft Interface after following Steps 1 through 5:
   - Verify that Port 2 or 3 is configured for CRAFT through a connection to the MPU Craft Port.

   Note: Ports 2 and 3 must be configured through the Craft Interface first before they can be used because they do not default to CRAFT.

   Reference: DLP-504 Local Craft Interface Connection

   Reference: DLP-549 Serial Port Configuration

7. If you are using the MPU Craft Port and are unable to logon to the local Craft Interface after following Steps 1 through 6:
   - Check your records to see if the MPU has been reconfigured for a different interface than Craft, such as a TBOS or TL1 interface.

   Note: The MPU Craft Port defaults to CRAFT but can also be configured for TBOS, TL1 or NONE. Refer to the TBOS and TL1 sections in this manual for additional information.

   Reference: DLP-549 Serial Port Configuration

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DUAL REPEATER INCOMPATIBILITY DIAGNOSIS

Summary: This TAP describes how to diagnose dual repeater software (MPU V5.2) incompatibilities for HLXCs, HLXRs, and HRXs; and also describes how they are reported. Except where noted, system configurations are assumed to include two HRXs, and the HLXCs and HLXRs are assumed to be compatible with MPU V5.2.

HLXC

An incompatible HLXC is any Version D or earlier HLXC without software support for a second HRX. In such a case, the HRX1 will detect the incompatible HLXR, set the alarm bit, and report "2ND-HRX-IN" in the serial number in its inventory data to "2ND-HRX-IN". If the HLXC is a Version D or earlier, **and** the HRX1 is a Version A, incompatibilities are not detectable. (Note: Version C or earlier HLXCs do not support any HRXs. However, a Version B HRX in the HRX1 position will set an alarm bit for an incompatible HLXR.) The MPU should activate the "Version Mismatch" alarm and display the HRX inventory with the corrupted serial number.

Reference: DLP-540 Inventory Display

HLXR

An incompatible HLXR is any Version D or earlier HLXR without software support for a second HRX. In such a case, the HRX1 will detect the incompatible HLXR, set the alarm bit, and report "2ND-HRX-IN" in the serial number in its inventory data to "2ND-HRX-IN". (Note: In addition, when Version B and C HLXRs are used, the HRX2 must shut off power to the HLXR to avoid damage.) The MPU should activate the "Version Mismatch" alarm and display the HRX inventory with the corrupted serial number.

HRX1

An incompatible HRX1 is any Version A HRX that has another HRX between it and the HLXR. This is diagnosed by the HLXC when it finds an HRX2 in the system. If the HLXC is a Version D or earlier, it cannot set the alarm bit for the incompatible HRX1, or corrupt the serial number. The HLXC will set the alarm bit for the incompatible HRX1 and report "OLD-HRX-IN" in the serial number field of the HRX1 inventory. Thus, a Version D (or earlier) HLXC with a Version A HRX in the first position (HRX1) cannot be diagnosed at all. The MPU should also activate the "Version Mismatch" alarm and display the corrupted serial number. If the HLXC is a Version D or earlier, the alarm bit for dual repeater incompatibility cannot be set. Thus, the MPU can only display the corrupted serial number.

HRX2

An incompatible HRX2 is a Version A HRX that has another HRX between it and the HLXC. This is diagnosed by the HRX1. As a result, systems with two incompatible HRXs cannot be diagnosed. The HLXC will set the alarm bit for the incompatible HRX2 and report “OLD-HRX-IN” in the serial number of field of the HRX2 inventory. The MPU should activate the “Version Mismatch” alarm and display the corrupted serial number.

HRX3

A third HRX is always incompatible. This situation is diagnosed by the HRX2. As a result, systems with three HRXs when the HRX2 is a Version A cannot be diagnosed. The HRX2 will set the serial number in the HRX2 inventory data to “3RD-HRX-IN.” The HLXC will set the alarm bit for the incompatible HLXR. The MPU should activate the “Version Mismatch” alarm and display the corrupted serial number. If the HLXC is a Version D or earlier, the alarm bit for dual repeater incompatibility cannot be set. Thus, the MPU can only display the corrupted serial number.

Dual Repeater Compatibility Indicators

Table 104-1 shows the various configurations that should be tested for dual repeater compatibility issues. All legal configurations require extensive testing.

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Table 104-1. Dual Repeater Compatibility Indicators

UNIT TYPE					INCOMPATIBILITY INDICATOR	CORRUPTED SERIAL NUMBER
HLXC*	HRX1**	HRX2**	HRX3	HLXR***		
NO INCOMPATIBILITIES						
New	--	--	--	New	None	None
New	--	--	--	Old	None	None
Old	--	--	--	New	None	None
New	New	--	--	New	None	None
Old	New	--	--	New	None	None
New	Old	--	--	New	None	None
New	New	--	--	Old	None	None
Old	Old	--	--	New	None	None
Old	New	--	--	Old	None	None
New	Old	--	--	Old	None	None
New	New	New	--	New	None	None
SINGLE INCOMPATIBILITIES						
Old	New	New	--	New	HLXR	2ND-HRX1-IN†
New	Old	New	--	New	HRX1	OLD-HRX1-IN†
New	New	Old	--	New	HRX2	OLD-HRX2-IN†
New	New	New	--	Old	HLXR	2ND-HRX1-IN†
New	New	New	Old/New	New	HLXR	3RD-HRX2-IN†
UNDETECTABLE INCOMPATIBILITIES						
Old	Old	Old/New	Any	Old/New	Undetectable	Not Shown
Old/New	Old	Old	Any	Old/New	Undetectable	Not Shown

* "New" HLXC refers to the Version E HLXC; "Old" HLXC refers to the Version D (or earlier) HLXC.

** "New" HRX refers to the Version B HRX; "Old" HRX refers to the Version A HRX.

*** "New" HLXR refers to the Version E HLXR; "Old" HLXR refers to the Version D (or earlier) HLXR.

† The corrupted serial numbers shown in these examples will appear in the Craft Interface's Inventory Status screen if the incompatibility is present.

GENERAL INFORMATION

SECTION 3: GENERAL INFORMATION

Content	Page

1 WARRANTY/SOFTWARE

The Product and Software warranty policy and warranty period for all Products of ADC Telecommunications, Inc. (hereinafter referred to as ADC) is published in ADC's Warranty/ Software Handbook. Contact the Business Broadband Group (BBG) Technical Assistance Center at 1-800-366-3891, extension 3223 (in U.S.A. or Canada) or 952-946-3223 (outside U.S.A. and Canada) for warranty or software information or for a copy of the Warranty/Software Handbook.

2 REPAIR/ADVANCE REPLACEMENT POLICY

All repairs of ADC Products must be done by ADC or an authorized representative. Any attempt to repair or modify ADC Products without prior written authorization from ADC shall void ADC's warranty.

If a malfunction cannot be resolved by the normal troubleshooting procedures, call the BBG Technical Assistance Center at 1-800-366-3891, extension 3223 (in U.S.A. or Canada) or 952-946-3223 (outside U.S.A. and Canada). A telephone consultation can sometimes resolve a problem without the need to repair or replace the ADC Product.

If, during a telephone consultation, ADC determines the ADC Product requires repair, ADC will authorize the return of the affected Product by the issue of a Return Material Authorization number and complete return shipping instructions. If service is affected, ADC can arrange to ship a replacement Product when available from designated inventory. In all cases, the defective Product must be carefully packaged to eliminate damage, and returned to ADC in accordance with issued ADC instructions.

3 REPAIR CHARGES

If the defect and the necessary repairs are covered by warranty, Buyer's only obligation is the payment of all transportation and associated costs in returning the defective Product to the location designated by ADC. ADC, at its option, will either repair or replace the Product at no charge and return the Product to Buyer with transportation costs paid by ADC, only when ADC contracted carriers are used. Requested return of Product by any other means will be at Buyer's cost. Buyer is responsible for all other associated costs in return of Products from ADC. If Product is Out of Warranty or NTF (no trouble found), ADC will charge a percentage of the current Product list price. To obtain the percentage factor for Out of Warranty or NTF Product, contact the ADC Product Return Department at 1-800-366-3891, extension 3000 (in U.S.A. or Canada) or 952-946-3000 (outside U.S.A. and Canada).

If a service affecting advance replacement Product is requested, the current list price of a new Product will be charged initially. A customer purchase order is required to ship an advance replacement Product. Upon receipt of the defective Product, there will be no credit issued by ADC to the buyer for any returned Product found to be Out of Warranty. ADC will credit buyer eighty percent (80%) of Product price charged for any In Warranty Product under the Program terms. Products must be returned within thirty (30) days to be eligible for any advance replacement credit. If repairs necessitate a field visit by an ADC representative, a customer authorization (purchase order) must be obtained prior to dispatching a representative. ADC will charge the current price of a field visit plus round trip transportation charges from Minneapolis to the customer's site.

4 REPLACEMENT/SPARE PRODUCTS

Replacement parts, including but not limited to button caps and lenses, lamps, fuses, and patch cords, are available from ADC on a special order basis. Contact the BBG Technical Assistance Center at 1-800-366-3891, extension 3223 (in U.S.A. or Canada) or 952-946-3223 (outside U.S.A. and Canada) for additional information.

Spare Products and accessories can be purchased from ADC. Contact Sales Administration at 1-800-366-3891, extension 3000 (in U.S.A. or Canada) or 952-946-3000 (outside U.S.A. and Canada) for a price quote and to place your order.

5 RETURNED MATERIAL

Contact the ADC Product Return Department at 1-800-366-3891, extension 3000 (in U.S.A. or Canada) or 952-946-3000 (outside U.S.A. and Canada) to obtain a Return Material Authorization number prior to returning an ADC Product.

All returned Products must have a Return Material Authorization (RMA) number clearly marked on the outside of the package. The Return Material Authorization number is valid for thirty (30) days from authorization.

6 CUSTOMER INFORMATION AND ASSISTANCE

For customers wanting information on ADC products or help in using them, ADC offers the services listed below. To obtain any of these services by telephone, first dial the central ADC telephone number, then dial the extension provided below.

The central number for calls originating in the U.S.A. or Canada is **1-800-366-3891**. For calls originating outside the U.S.A. or Canada, dial country code “1” then dial **952-946-3000**.

Sales Assistance **Extension 3000**	• Quotation Proposals • Ordering and Delivery • General Product Information
Systems Integration **Extension 3000**	• Complete Solutions (from Concept to Installation) • Network Design and Integration Testing • System Turn-Up and Testing • Network Monitoring (Upstream or Downstream) • Power Monitoring and Remote Surveillance • Service/Maintenance Agreements • Systems Operation
BBG Technical Assistance Center **Extension 3223** **E-Mail: technical@adc.com**	• Technical Information • System/Network Configuration • Product Specification and Application • Training (Product-Specific) • Installation and Operation Assistance • Troubleshooting and Repair/Field Assistance
Product Return Department **Extension 3748** **E-Mail: repair&return@adc.com**	• ADC Return Authorization number and instructions must be obtained before returning products.

Product information may also be obtained using the ADC web site at **www.adc.com** or by writing ADC Telecommunications, Inc., P.O. Box 1101, Minneapolis, MN 55440-1101, U.S.A.

This publication may be verified at any time by contacting ADC’s Technical Assistance Center at 1-800-366-3891, extension 3223 (in U.S.A. or Canada) or 952-946-3223 (outside U.S.A. and Canada), or by writing to ADC Telecommunications, Inc., Attn: Technical Assistance Center, Mail Station #77, P.O. Box 1101, Minneapolis, MN 55440-1101, U.S.A.

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